SYSTEMATICS OF THE FAMILY NASSARIIDAE

(MOLLUSCA: GASTROPODA)

By

WALTER O. CERNOHORSKY

AUCKLAND INSTITUTE AND MUSEUM

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SYSTEMATICS OF THE FAMILY NASSARIIDAE

1. INTRODUCTION

The gastropod family Nassariidae is a member of the rachiglossate order Neogastropoda, and with the closely related Buccinidae belong to the super-family Buccinacea. Species live in tropical, temperate and even colder waters of all major geographical provinces, but species concentration is highest in tropical and subtropical regions, particularly the Indo-Pacific. Species of Nassariidae are a dominant element of shallow waters of the intertidal zone where they sometimes occur in colonies buried in clean or muddy coral sand; only a few species live beneath rocks of the intertidal zone or beyond the littoral zone in coral sand or Coralline algae, to a depth not exceeding 2013 metres (with an unconfirmed depth of 2660m), and a temperature tolerance as low as 1.5 °C. When encountered in colonies, *Nassarius* will reach enormous numbers. In the West Atlantic *N. (Ilyanassa) obsoleta* (Say), a density of 5860 specimens per square metre has been recorded (S. C. BROWN 1969).

ABBREVIATIONS AND METHODS

Abbreviations of type-species designations and classification of zoological names follow the standard of the Treatise on Invertebrate Paleontology (Moore et al. 1960). The radulae of some species still remain unknown and a subsequent re-assignment of some species at a future date may become necessary.

For the purpose of this study, all available type specimens were examined, measured and photographed for reference. Thousands of specimens of Nassariidae contained in collections of major Museums, Institutions and private collectors were examined, and living specimens of about half the known species were collected by the author on tropical reefs. All available literature on the subject has been consulted, and new taxa published in obscure Journals and tracts that may have been overlooked or are not readily obtainable, would be minimal. Species which have been only briefly diagnosed and never illustrated, will necessarily remain *nomina inquirenda* pending a future discovery of the types, in which event changes and revision of the species concept are to be anticipated. The classification proposed in this study will supplement the arrangement currently in preparation for the Treatise on Invertebrate Paleontology, where important changes in generic concepts have not been incorporated.

The sheer size of the family Nassariidae precludes a comprehensive specific treatment of all known species of the family in this monograph. Descriptions of all Recent and fossil species of Nassariinae from the Indo-Pacific region, and all species of Cylleninae, are included, while check-lists of Nassariinae from the Pacific coast of America and the West and East Atlantic are appended. The Nassariinae of these regions have already been monographed by Demond (1952), Keen (1971), Abbott (1974), Cernohorsky (1975a) and Kaicher (1982), while West African Nassariidae have been studied by Knudsen (1956), Adam & Glibert (1974, 1976) and Adam (1976). The subfamily Dorsaninae, comprising species of *Buccinanops* from S.E. South America, *Dorsanum* from West Africa and *Bullia* from South Africa and the Western Indian Ocean, is extensive enough to warrant a separate monograph.

Abbreviations of names of Institutions are as follows:

AIM	=	Auckland Institute and Museum, Auckland, N.Z.
AMS	=	Australian Museum, Sydney, Australia.
BMNH	=	British Museum (Natural History), London, England.
LACM	=	Los Angeles County Museum of Natural History, Los Angeles, U.S.A.
MNHNP	=	Museum National d'Histoire Naturelle, Paris, France.
NM	=	Natal Museum, Pietermaritzburg, South Africa.
NMNZ	=	National Museum of New Zealand, Wellington, N.Z.
NMV	=	National Museum of Victoria, Melbourne, Australia.
NSMT	=	National Science Museum, Tokyo, Japan.
PMBC	=	Phuket Marine Biological Centre, Thailand
SDNHM	=	San Diego Museum of Natural History, San Diego, U.S.A.
SMOM	=	Station marine d'Endoume et Centre d'Oceanographie, University d'Aix-Marseille, Marseille, France.
TAU	=	Tel Aviv University, Tel Aviv, Israel.
TMAG	=	Tasmanian Museum and Art Gallery, Hobart, Australia.
USNM	=	National Museum of Natural History, Smithsonian Institution, Washington, U.S.A.
WAM	=	Western Australian Museum, Perth, Australia.
ZMA	=	Zoological Museum, University of Amsterdam, Holland.
ZMC	=	Zoological University Museum, Copenhagen, Denmark.
ZSI	=	Zoological Survey of India, Calcutta, India.

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II. FAMILY NASSARIIDAE

FAMILY CHARACTERS

Species of Nassariidae are characterised by ovate, elongate-ovate or even fusiformly-ovate shells which have convex, flat-sided or rarely concave whorls, a moderately wide aperture, smooth, denticulate or lirate outer lip and a smooth, plicate or wrinkled columella, a very deep siphonal notch and a paucispiral or multispiral, smooth or carinate protoconch. The shell surface is sometimes smooth but usually bears a sculpture of axial ribs, nodules, spines, spiral threads or grooves.

Nassariidae is very closely allied to the Buccinidae and a separation on a subfamilial rather than familial basis would be taxonomically more appropriate. The only differentiation between species of the two families is on the basis of radular dentition, the animal's foot, and sometimes operculum and shell-characters. Some buccinid species of the genera *Hindsia*, *Macron* and *Clea*, also have multidentate rachidians and some species of Nassariidae also have animals which lack the 2 metapodial tentacles on the posterior end of the foot and also have a simple operculum as in the Buccinidae. I concur with Ponder's (1973) remarks that the magnitude of these differences is not great, that there are practically no anatomical features which could be used consistently to separate the two families and that the Nassariidae are phylogenetically much closer to the Buccinidae than modern systematic arrangements will concede. It is thus an aggregate of characters rather than any single one which enables us to segregate the Nassariidae from the Buccinidae and allows us to retain the family-group name Nassariidae on conventional grounds.

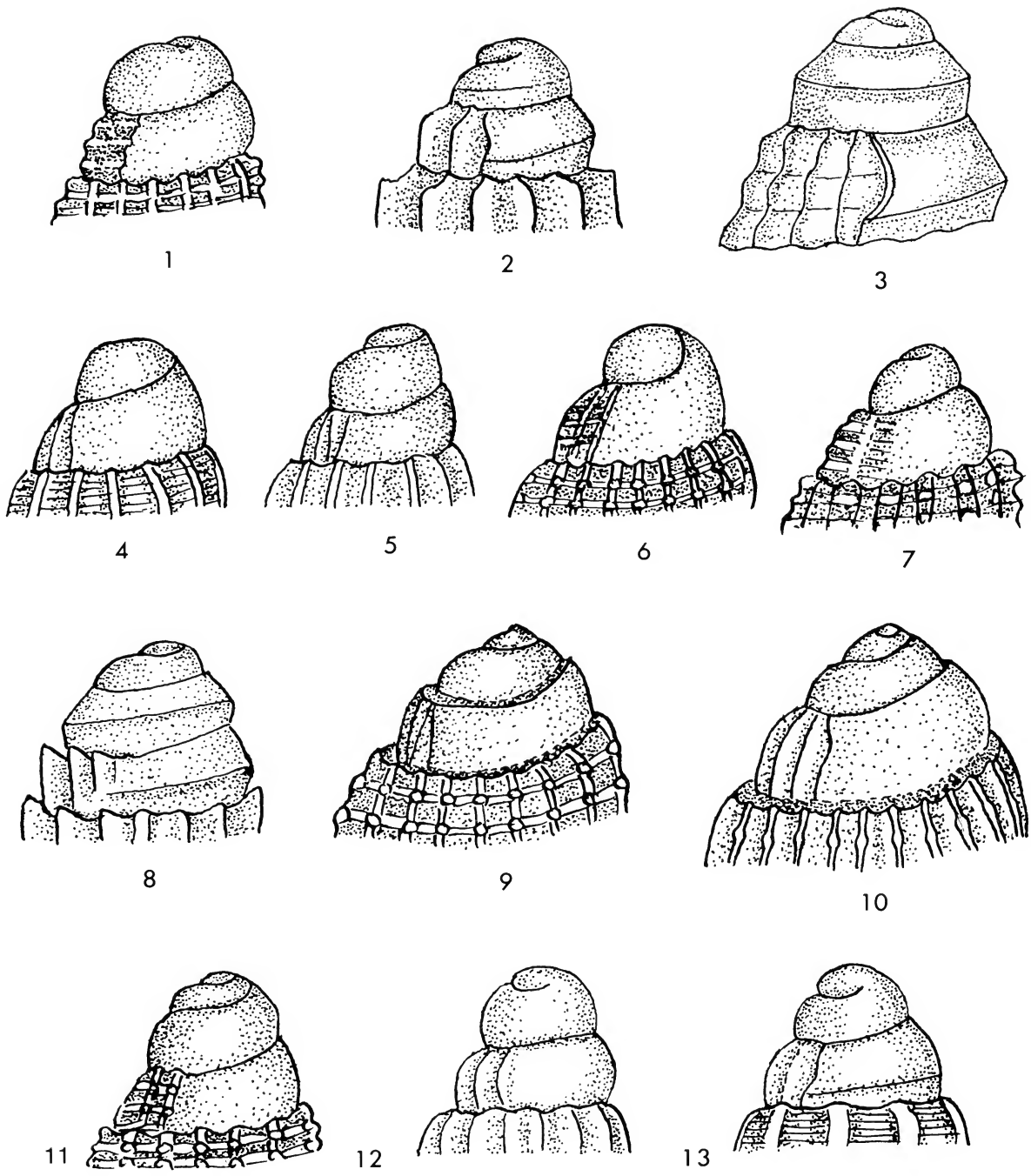
OPERCULUM: The size and shape of nassarid opercula are variable, but opercula are always corneous, light to dark brown in colour and sometimes with a dark brown pattern within. In *Bullia* species opercula can be normal-sized or very small, and either simple or serrated at the margins. Simple and serrated opercula can also be found in Nassariinae, and in *Nassarius granifer* (Kiener), a species which usually has a serrated operculum, individuals were found with a smooth operculum. The variability in shape and density of serrations in opercula of *N.arcularia* (Linnaeus), taken in the same locality, is illustrated (Fig. 20). Taki (1951) has reported on opercular regeneration in one Japanese species of *Nassarius*.

PROTOCONCH: Protoconchs in Nassariidae are also variable and do not follow any generic pattern. They can be smooth and paucispiral, smooth and multispiral or multispiral and carinate. The peripheral keel, when present, can be quite distinct, and individuals of a species with a distinctly carinate protoconch all display this feature. In *Nassarius oneratus* (Deshayes), the peripheral keel on the protoconch is rather feeble and can disappear even with the slightest of wear. Smooth and keeled protoconchs can of course appear in species of the same genus-group (Figs. 1-19; 21-23).

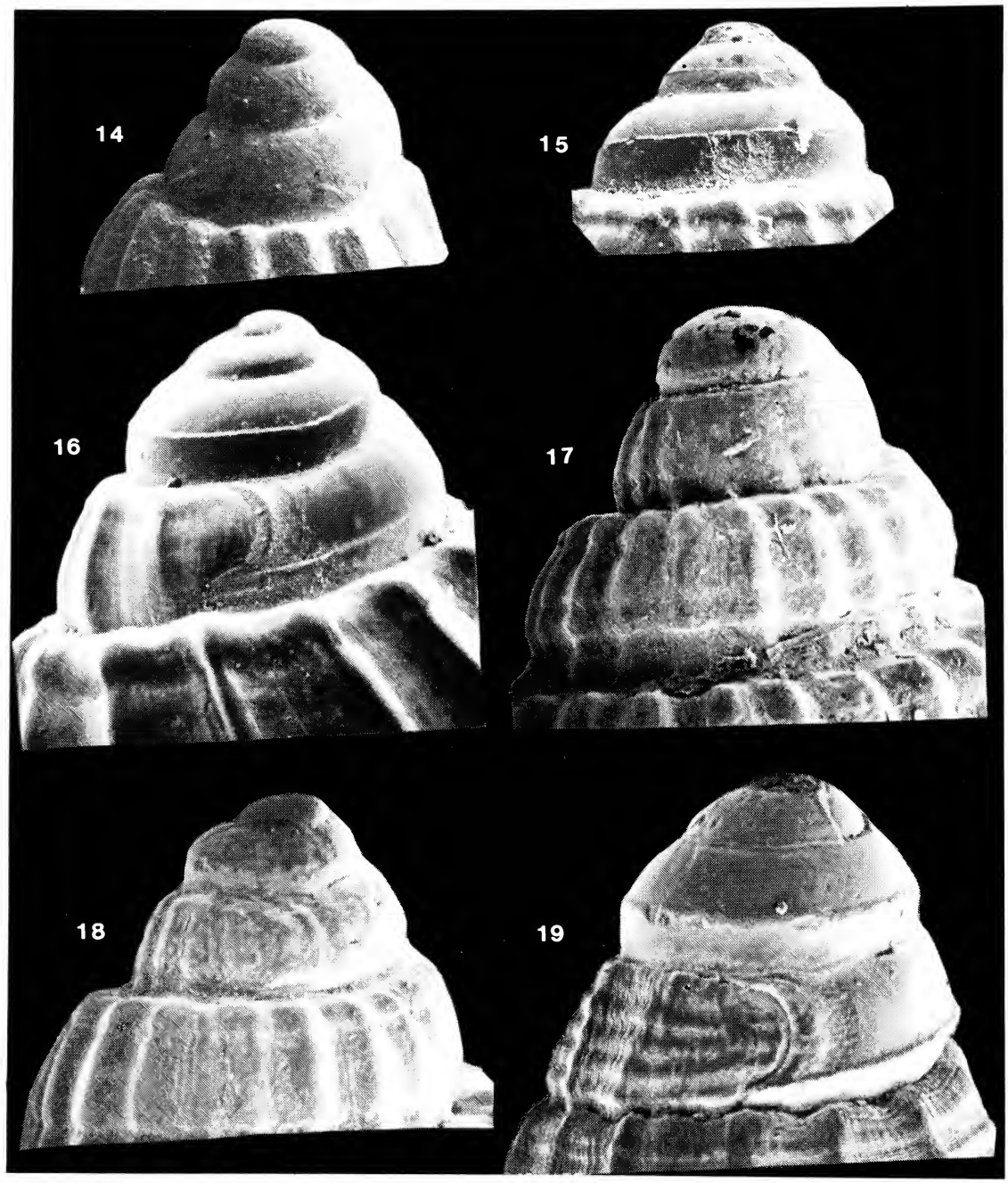
Shuto's (1974) suggestion that a species with egg-capsules containing numerous eggs usually produce pelagic, planktotrophic veligers, and species with only a single egg produce directly developing, lecithotrophic veligers, certainly holds true for the Nassariidae. The mode of development is also reflected in the protoconch, species with planktotrophic veligers having a multispiral protoconch and species with lecithotrophic veligers having a paucispiral protoconch.

Malformation in Nassariidae appears to be more frequent than in other families of Neogastropoda, and appears to be primarily due to teratological damage visible usually on the spire whorls in the form of fissures and repair scars. Growth on subsequent whorls to where damage occured becomes accelerated, with sutures dipping more obliquely and the shell assuming a considerably more fusiform shape. The distortion is most pronounced on the body whorl which becomes more elongate and usually roundly angulate in its anterior third. Malformation is apparent in the distortion of the aperture, with the outer lip twisted and oriented obliquely to the axis, a distorted and often exagerrated columellar callus and a twisted siphonal fasciole. The usually distinct parietal denticle is indistinct and the columella also becomes edentulous. The genus-group *Venassa* v. Martens, 1881 (type-species *Nassa pulvinaris* v. Martens, 1881) has been based on such malformed individuals.

Malformation in Nassariidae has been reported by Vayssiere (1910), Lamy (1930), Segrati (1972), Munari (1974), Oberling (1974), Cernohorsky (1975b) and "The Editor" (1980).



Figs. 1-13. Protoconchs of Nassariinae. 1. *Nassarius (Alectrion) glans glans* (Linnaeus) 2. *N. (Plicarcularia) pullus* (Linnaeus). 3. *N. (P.) oneratus* (Deshayes). 4. *N. (Gussonea) corniculus* (Olivi). 5. *N. (Phrontis) tiarula* (Kiener). 6. *N. (Sphaeronassa) mutabilis* (Linnaeus). 7. *N. (Hinia) reticulatus* (Linnaeus). 8. *N. (Profundinassa) babylonicus* (Watson). 9. *N. (Caesia) perpinguis* (Hinds). 10. *N. (Cryptonassarius) ephamillus* (Watson). 11. *N. (Hima) incrassatus* (Stroem). 12. *N. (Hima) pauperus* (Gould). 13. *Hebra horrida* (Dunker).



Figs. 14-19. Protoconchs of Nassariinae. 14. *Nassarius arcularia arcularia* (Linnaeus). 15. *N.coronatus* (Bruguière). 16. *N. (Niotha) sinusigerus* (A.Adams). 17. *N. (N.) livescens* (Philippi). 18. *N. (Telasco) luridus* (Gould). 19. *N.(T.) gaudiosus* (Hinds) [SEM – photographs].

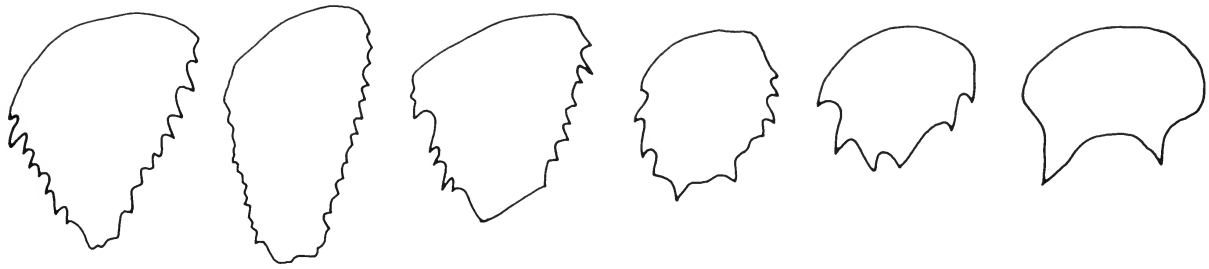
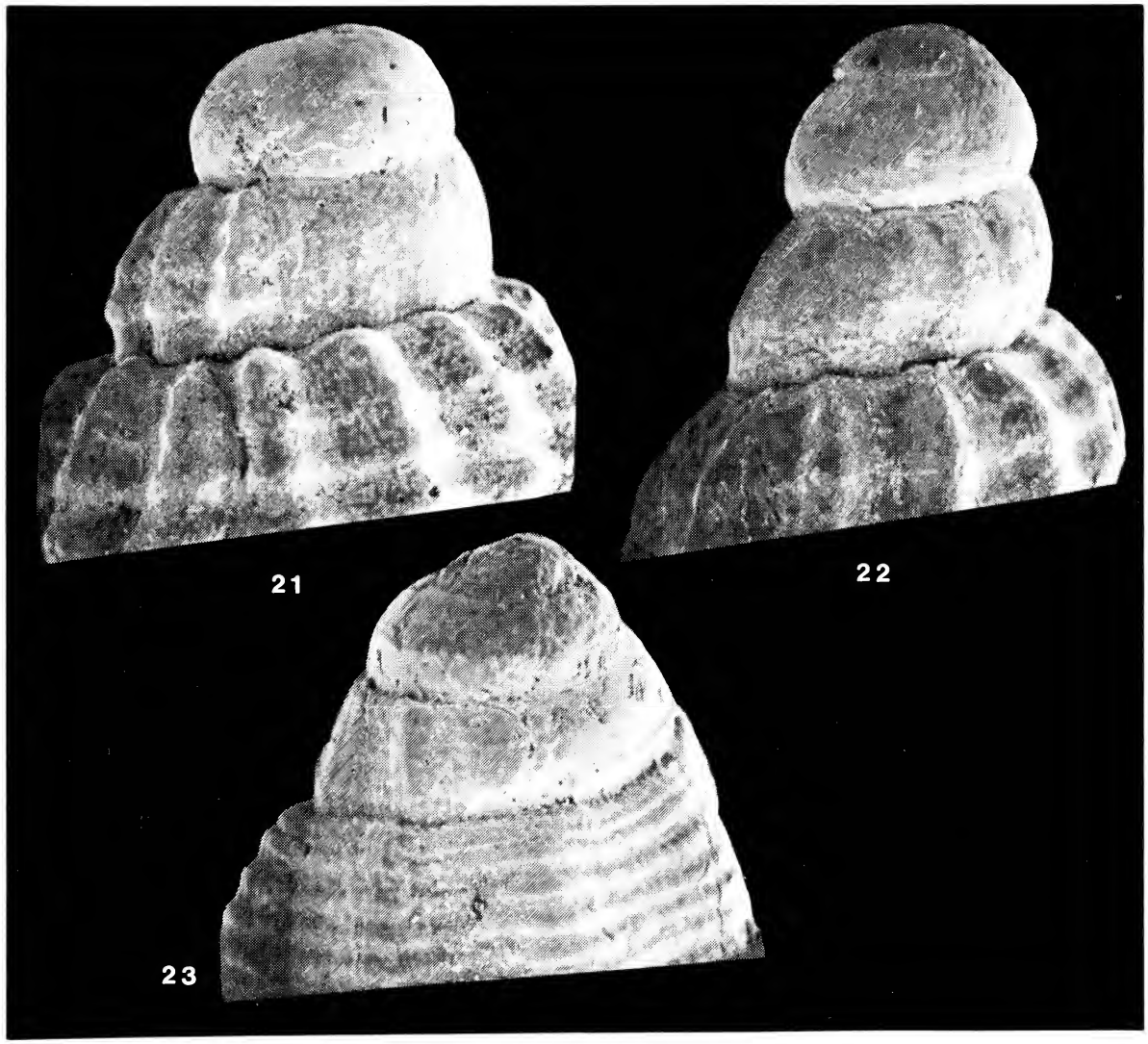


Fig. 20. *Nassarius arcularia arcularia* (Linnaeus). Kakula I, Vanuatu. Variation in outline of opercula.



Figs. 21-23. Protoconchs of Nassariinae. 21. *Nassarius (Hima) pauperus* (Gould). 22. *N. (H.) capensis* (Dunker). 23. *Hebra horrida* (Dunker).

GENERAL BIOLOGY

The occurrence of some species of Nassariidae in large colonies has enabled research workers to engage in diverse spheres of research into species of the family due to an abundance of easily obtained research material. Some species, such as the West Atlantic mud-snail *Nassarius (Ilyanassa) obsoletus* (Say), and the European *N. (Hinia) reticulatus* (Linnaeus), have been extremely well researched and reported upon. Data on the general biology and anatomy may be found in Rotarides (1931), Bekman (1941), Risbec (1952) and Gomoiu (1964). Stomach and digestive systems have been studied by Graham (1949), Martoja (1961, 1964), and Brown (1969), the genital duct by Fretter (1941) and Johannson (1957), chromosomes by Moment (1936) and Nishikawa (1962), faeces by Arakawa (1963), the osphradium by Newell & Brown (1977), the muscular system by Rotarides (1941) and growth-stages by Kisch (1950).

THE ANIMAL

The animal in the Nassariidae is usually large to very large, the anterior part of the foot is curved and then constricted into points, the posterior of the foot is also curved or concave and usually has 2 or rarely 1, short or moderately long metapodial tentacles which in some species are completely lacking. The presence or absence of metapodial tentacles does not appear to follow any supraspecific group pattern and is therefore of little aid in a generic arrangement. The type-species of *Gussonea* Monterosato (formerly *Amyclina* Iredale), i.e. *Nassarius corniculus* (Olivi) and *N. (Ilyanassa) obsoletus* (Say), both lack metapodial tentacles in the adult although 1 tentacle is present at the time of hatching in *N. (I.) obsoletus*. *N.festivus* (Powys) has also only 1 metapodial tentacle (Dr. T. Habe *in litt.*), whereas *N.vibex* (Say), *N.reticulatus* (Linnaeus), *N.mutabilis* (Linnaeus), *Cyclope neritea* (Linnaeus) and most tropical nassariine species have 2 metapodial tentacles.

Most species of Nassariinae have a pair of long and slender tentacles with eyes situated on the side of a swelling at the base, but the species *Hebra horrida* (Dunker) has very short, stubby tentacles with the eyes situated on the top. Although eyes are absent in species of *Bullia s.str.* and present in most species of *Nassarius s.lato*, at least one species of *Nassarius*, i.e. *N.dilutus* (E. A. Smith), is known where eyes are absent. The siphon is long and slender and the proboscis contains the radular ribbon. Sexes are separate and the male verge, which is basically similar to other Neogastropod groups, is situated behind the right head tentacle (Fig. 24).

FEEDING: Nassariidae are primarily carnivorous and well-known as scavengers. Some species are deposit feeders and have also been observed feeding on opisthobranch (cephalaspidean) egg masses, their proboscis moving inside the egg-capsules seeking out individual eggs. *Nassarius (Ilyanassa) obsoletus* (Say), although a preferential carrion feeder, will also subsist on algae and detritus. Nassariidae are active predators but frequently also become victims of other predators (Gabriel 1936; Gonor 1965; Loch 1977).

LOCOMOTION: In the family Nassariidae locomotion pattern is widely divergent. In the subfamily Dorsaninae, *Bullia* species show a monotaxic retrograde locomotor pattern, i.e. locomotion is achieved by only one set of waves along the foot opposite to the direction of movement. Most species of the subfamily Nassariinae move by pedal cilia, and such ciliary movement has been observed by this author in *Nassarius distortus* (A. Adams), *N.albescens albescens* (Dunker), *N.pauperus* (Gould) and *N.luridus* (Gould). Miller (1974) also reports *N.granifer* (Kiener) as having ciliary locomotion. That mode of locomotion is abandoned when the animal is burrowing in sand or escaping. When burrowing, the anterior curved portion of the foot is used like a shovel and spade at the same time, and a strong muscular movement thrusts the animal and shell at an oblique entry into the coarse sand. After 11 seconds the animal of *N.distortus* (A. Adams) disappeared in the sand (Figs. 25, 26). When *N.granifer* (Kiener) was placed on the palm of the hand, it displayed a typical escape response by arching and twisting its foot and flipping over, similarly to the behaviour of Strombidae.

For reports on locomotion and escape response in Nassariidae see Copeland (1919), Weber (1924), Hoffmann (1929), Bouse (1935) and Miller (1974).

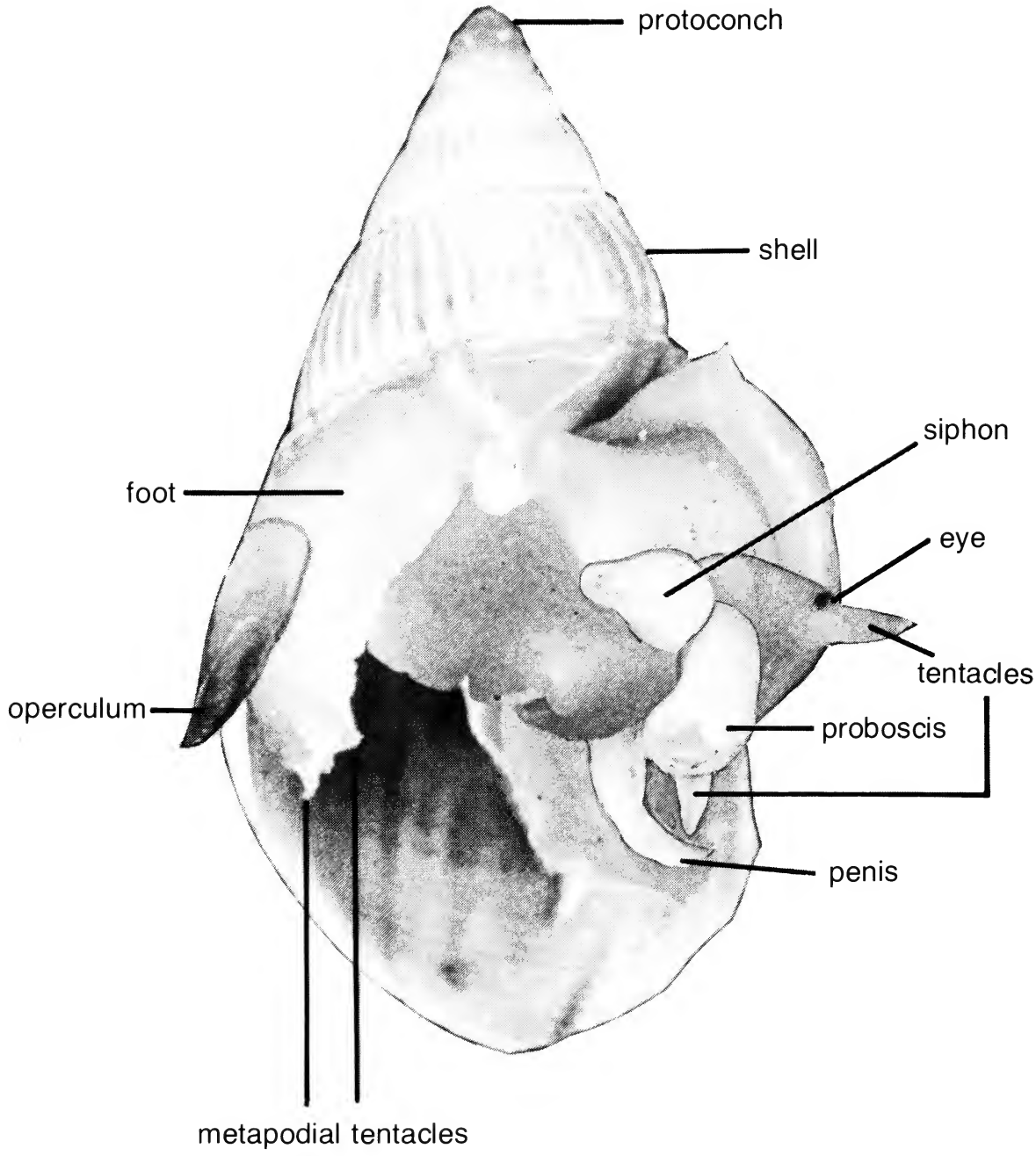
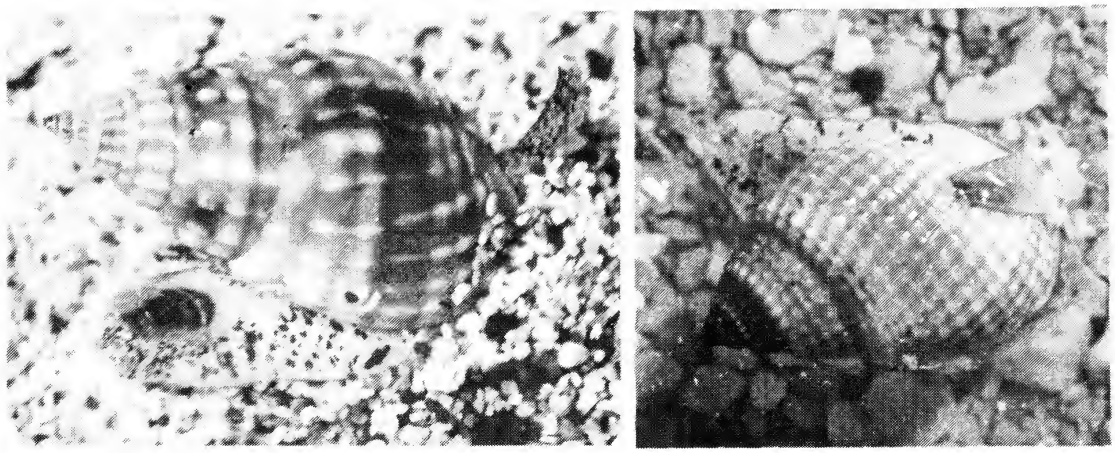


Fig. 24. Animal of *Nassarius crebricostatus* (Schepman). Exposed in shell.



25 26

Figs. 25,26. Burrowing action of Nassariinae. 25. *Nassarius distortus* (A.Adams). 26. *N. albescens albescens* (Dunker).

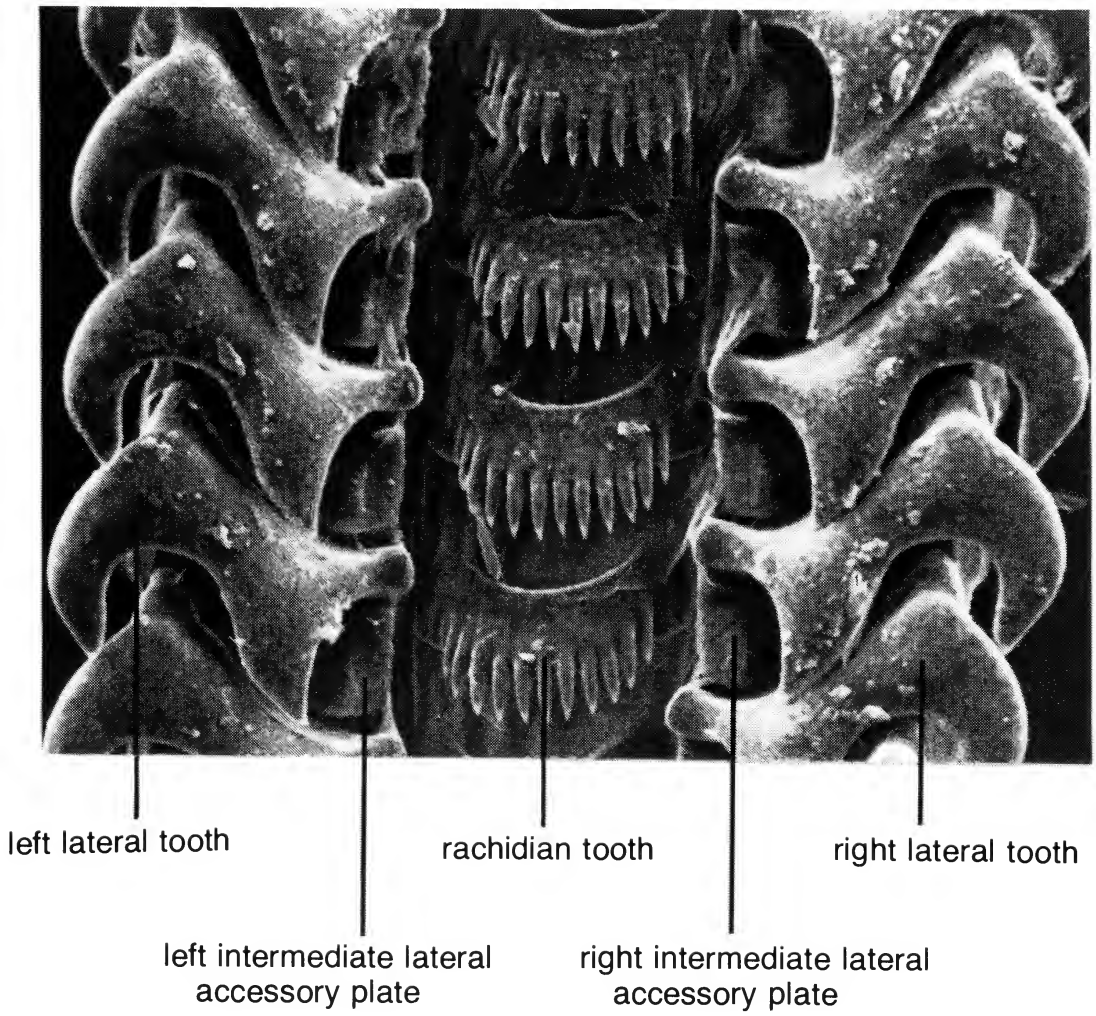


Fig. 27. Part of radular ribbon showing four transverse rows of *Nassarius oneratus* (Deshayes) [SEM – photograph, magnif. x 150].

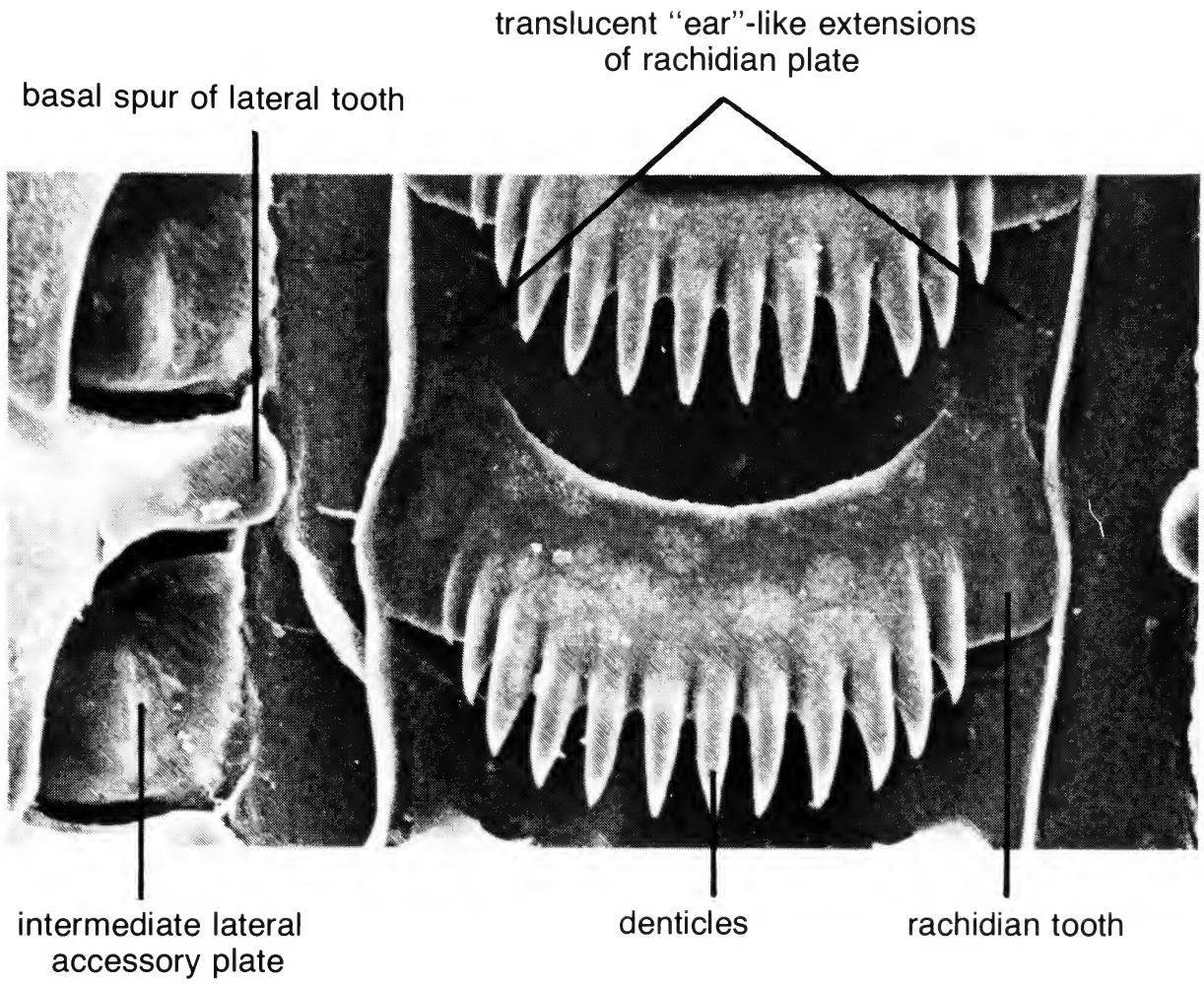
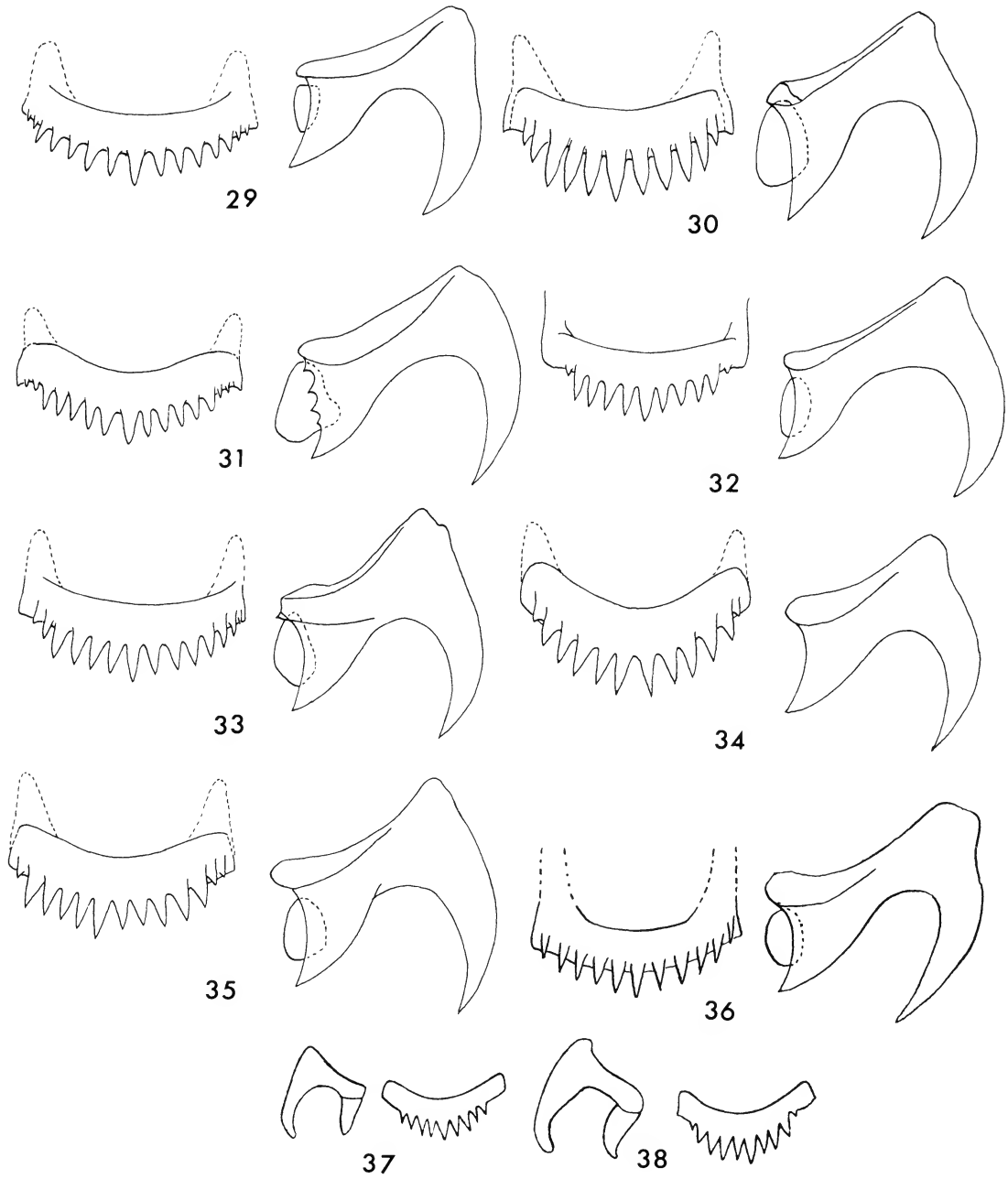


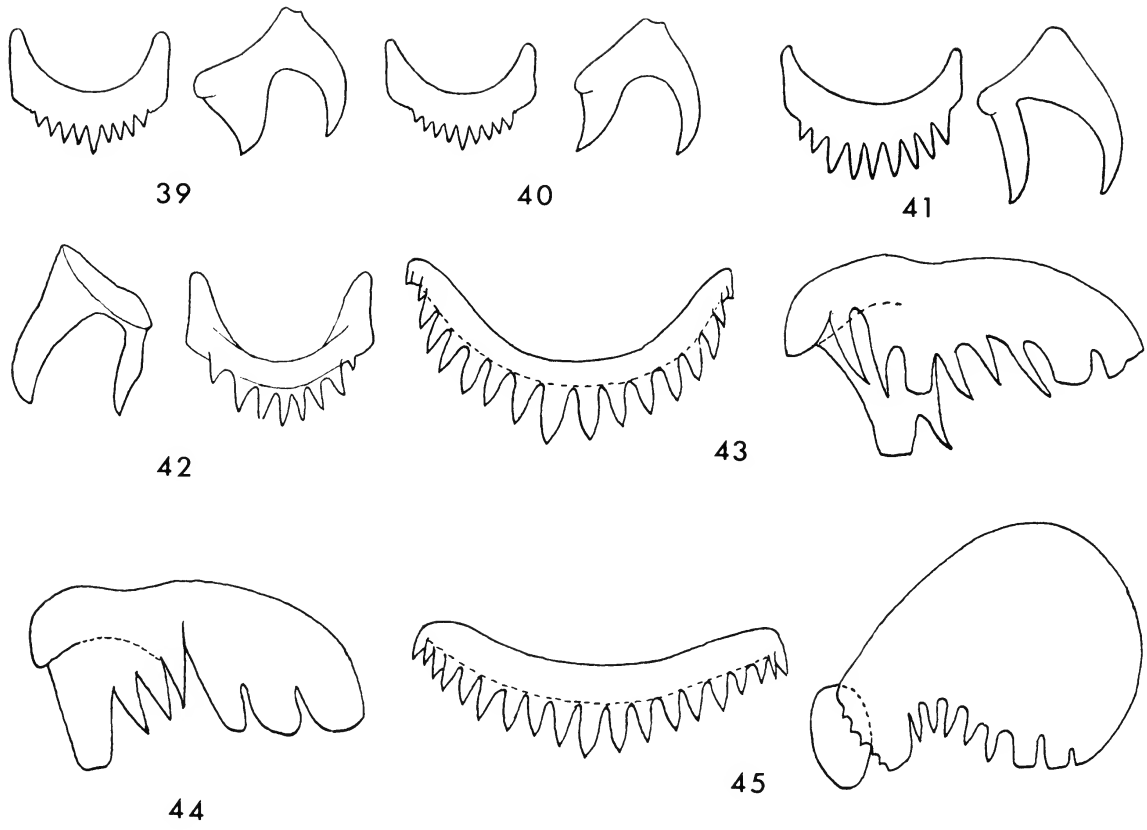
Fig. 28. Enlargement of rachidian and basal spur of lateral tooth and accessory lateral plate of *Nassarius oneratus* (Deshayes) [SEM – photograph, magnif. x 320].

THE RADULA

The radula of Nassariidae is typically Buccinacean, consisting of 3 teeth per row and occasionally an additional ovate to trigonal, cuspless plate which is interposed between the rachidian and lateral teeth and can be sometimes partly overlapped by the latter (Figs. 27, 28). The small plate was first recognised by Troschel (1867) who called it the "accessorische Platte" and for want of a better term is referred to as the accessory lateral plate. Shuto's (1969) term "lateral teeth" is incorrect since all Nassariidae have one lateral tooth on each side of the rachidian tooth, but not all Nassariidae have an accessory lateral plate. A similar plate of unknown function has been recorded in the taenioglossate ovulid genus *Pedicularia* Swainson. Troschel (1867) was not quite certain whether the accessory lateral plate was a rudimentary lateral, in which case the actual lateral would become the inner marginal, or if this plate is an inner, degenerate lateral tooth. From a structural viewpoint, the small accessory plate would make an excellent pivoting point for the laterals, but would not account for the variation in size and shape and random presence or absence among related species of Nassariidae. The real function and origin of the accessory lateral plate remain obscure. Subgenera like *Plicarcularia, Niotha* and *Alectrion* do have accessory lateral plates, but some species of *Zeuxis* do have lateral plates while others do not (Figs. 29-45).



Figs. 29-38. Half-row of radulae of Nassariinae. 29. *Nassarius arcularia arcularia* (Linnaeus). 30. *N. (Alectrion) glans glans* (Linnaeus). 31. *N. (Plicarcularia) pullus* (Linnaeus). 32. *N. (Niotha) conoidalis* (Deshayes in Bélanger). 33. *N. (Telasco) luridus* (Gould). 34. *N. (Zeuxis) margaritifer* (Dunker). 35. *N. (Z.) comptus* (A.Adams) [all after Cernohorsky, 1972]. 36. *N. (Aciculina) vittatus* (A.Adams). 37. *N. (Pygmaeonassa) ennurensis* (Preston). 38. *N. (P.) subconstrictus* (Sowerby) [figs. 37 and 38 after Annandale & Prashad, 1919].



Figs. 39-45. Half-row of radulae of Nassariinae ctd. 39. *Nassarius (Profundinassa) babylonicus* (Watson). 40. *N. (Hima) kochianus* (Dunker). 41. *Demoulia abbreviata* (Gmelin) [all after Barnard, 1959]. 42. *D.obtusata* (Link) [after Thiele, 1929]. 43,44. *Hebra horrida* (Dunker). 43. Half-row of radula. 44. Lateral only from another specimen. 45. *H. subspinosa* (Lamarck) [after Cernohorsky, 1972].

Troschel (1867) remarked that the radulae of Nassariidae he examined were all so similar in basic characters, and that on the basis of the radula there appeared to be no reason to separate the various groups generically. Radular studies of Indo-Pacific Nassariidae tend to confirm Troschel's contention, with the sole exception of 2 species of the genus *Hebra* H. & A. Adams. *Hebra horrida* (Dunker), and *H.subspinosa* (Lamarck), have a radula which differs widely, particularly in the form of laterals, from the stereotyped pattern of tropical Nassariidae. The rachidians are narrow, curved and multicuspid and the laterals are complicated in structure, being humped and having squared cusps which are reminiscent of some columbellid laterals. *H.horrida*, the type-species of *Hebra*, does not have lateral accessory plates but *H.subspinosa*, a species with a typical *Hebra* radula, does have an accessory plate (Fig. 45).

There is a certain amount of variability in nassarid radulae, either between individuals of the same species, within one and the same individual, or between males and females of a species. A specimen of the East Australian *Nassarius nigellus* (Reeve), had lateral teeth with either one, two or three small intermediate central denticles. A male of the Indo-Pacific *N.quadrasi* (Hidalgo), had a lateral tooth with a smooth cutting edge of the inner cusp and 3 small intermediate central denticles. A female of the same species and from the same locality, had a denticulate cutting edge of the inner cusp of the lateral but lacked the 3 small intermediate central denticles.

The radula of Nassariidae has usually been separated from the Buccinidae on features of arched rachidians with numerous denticles, but the lateral bicuspid teeth are very similar to those of the Buccinidae. The nassarid radula is an offshoot of the buccinid radula, and a close relationship is still evident in the radulae of the buccinid genera *Macron* H. & A. Adams and *Clea* A. Adams.

Radulae of Nassariidae have been illustrated by Annandale & Prashad (1919), Peile (1936, 1937), Kessell (1939), Habe (1945), Risbec (1952), Barnard (1959), Morton (1960), Cernohorsky (1972a) and Kaicher (1972).

LARVAL DEVELOPMENT

The known spawns of species of Nassariidae are highly individual in form and type of development, and it appears that the mode of development shows specific differences without giving the impression of being useful in a supraspecific taxonomic arrangement. Closely allied subgenera have sometimes a different life-history, and rather than phylogenetic influences, a direct, non-pelagic development is the result of environment, particularly colder water temperatures in some instances.

Egg-capsules are variable in shape, either vasiform, lens-shaped, pouch-shaped, triangular, bell-shaped or many-sided, smooth or spiky, and are deposited either in rows or clusters, upright, slanting or flattened. Egg-capsules can have a moderately long stalk or no stalk at all. Egg-masses are deposited in nature on hydroids, Bryozoa, Zoostera, Caulerpa, stones, empty shells, any hard substrate or even the operculum, or they may be retained within the fold of the female's foot. The number of egg-capsules varies from 2 to 4,600, and the number of eggs per capsule from 1 to 300 in a species of Nassariinae and up to 2,500 eggs per capsule in the genus *Buccinanops*. Eggs measure from 50 to 700 microns and in many species only a few eggs hatch while others serve as nurse-eggs. In tropical species of Nassariidae, females spawn all the year round and it takes only 4 days from egg-laying to hatching, 6 days in some Caribbean species and c. 3-4 weeks in species living in temperate seas. In some species eggs hatch as planktonic veliger larvae in others as crawling young, while 8 species are known to be ovoviviparous (Knudsen 1956; Kaicher 1972, 1982; Cather 1973a, 1973b; Adam & Glibert 1974; Kilburn 1978 and Cernohorsky 1982a).

The European *Cyclope neritea* (Linnaeus), the tropical Indo-Pacific *Nassarius glans glans* (Linnaeus), *N.livescens* (Philippi), *N.pullus* (Linnaeus) and the East Australian *N.glans particeps* (Hedley), belong to 4 different genus-groups but all have egg-capsules with a single, larger egg. *Cyclope neritea* and *Nassarius glans* have directly developing, non-pelagic crawling veligers, whereas *N. livescens* has a very short pelagic stage and *N.pullus* has pelagic larvae. In the South American *Buccinanops moniliferus* (Kiener) egg-capsules are attached to the callous area of the female shell by means of a short peduncle. Although each capsule contains up to 1,600 eggs, only a single embryo develops, with the remaining eggs serving as nurse-eggs. Development is direct, with the veliger hatching at the crawling stage (Penchaszadeh, 1971a, 1971b) [Figs. 46-75].

The mode of larval development in Nassariidae can be divided in 3 main groups and 4 sub-groups:

Group 1: In this group the young hatch as pelagic veliger larvae with a long or moderately short planktonic stage (1 week – 2 months).

a) egg-capsules with many eggs (all develop). Examples: *Nassarius reticulatus* (Linnaeus); *N.pygmaeus* (Lamarck); *N.incrassatus* (Stroem); *N.jacksonianus* (Quoy & Gaimard); *N.obsoletus* (Say); *N.vibex* (Say); *N.festivus* (Powys); *N.albus* (Say); *Dorsanum miran* (Bruguière).

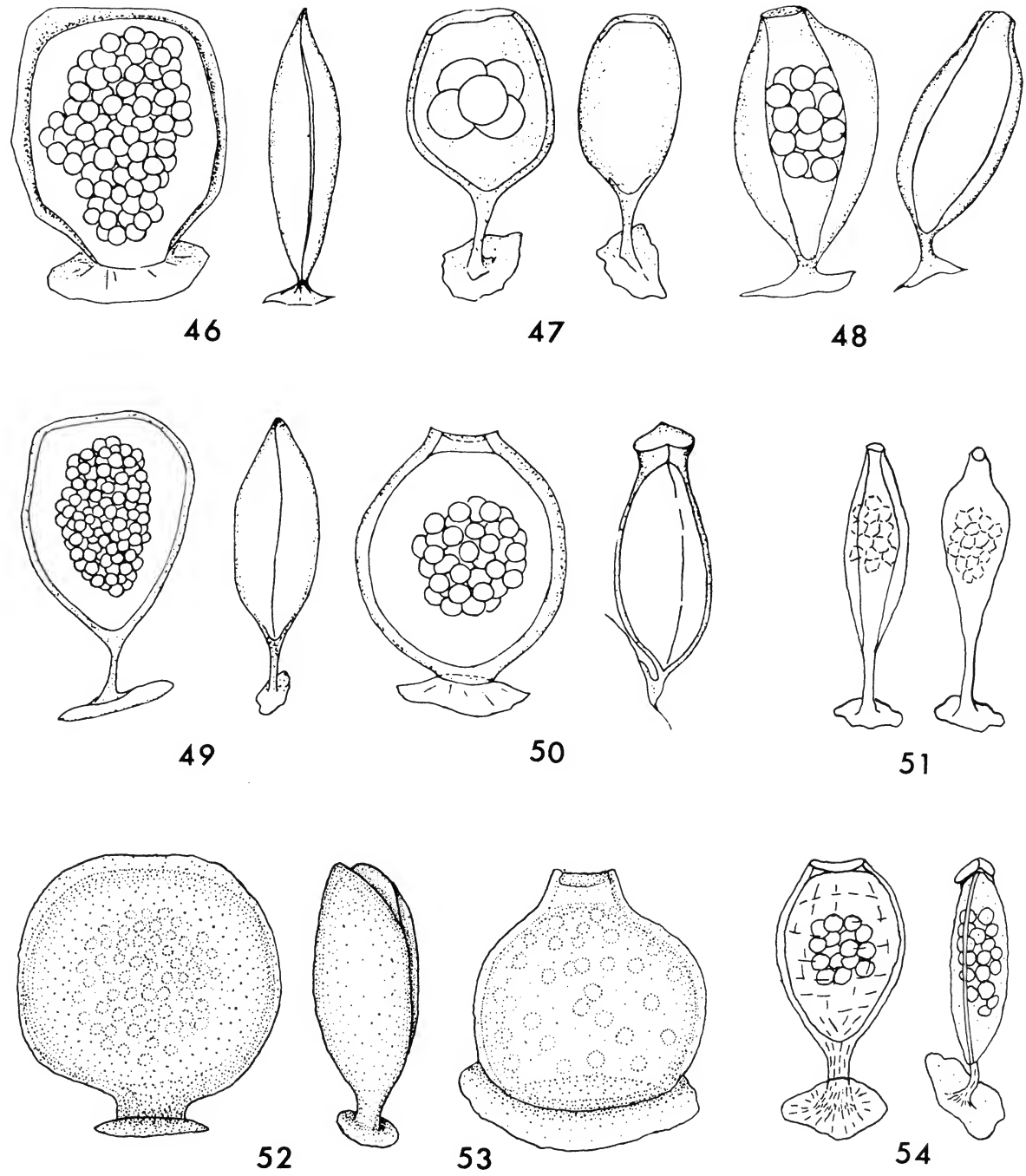
b) egg-capsules with a single egg. Examples: *Nassarius pullus* (Linnaeus); *N.livescens* (Philippi); "*N.canaliculatus* Lamarck"; "*N.costatus* A. Adams" (= *N.castus* Gould).

Group 2: In this group development is direct and young hatch as miniature crawling young.

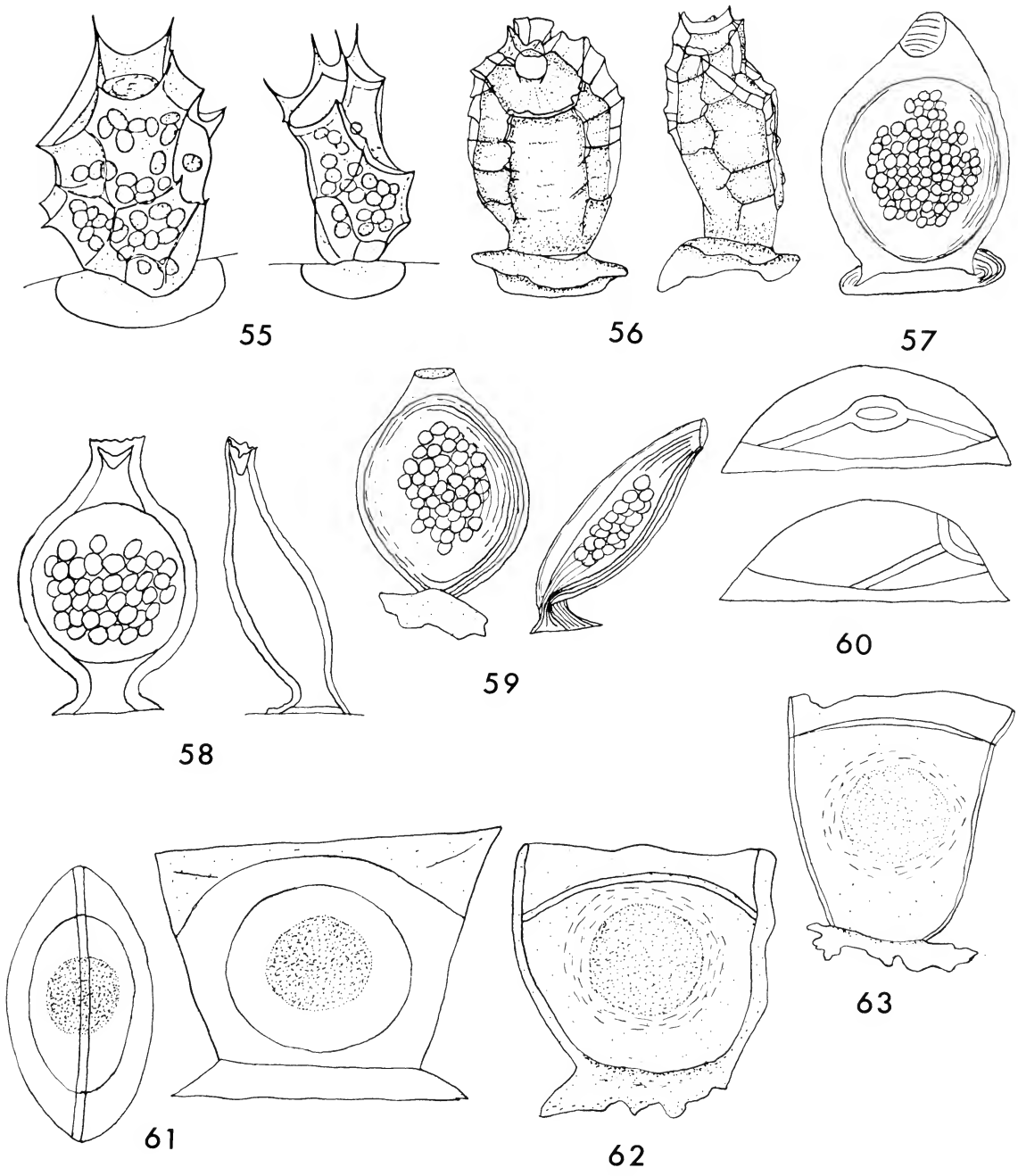
a) egg-capsules with many eggs but only 1-4 develop, others used as nurse-eggs. Examples: *Bullia melanoides* (Deshayes in Bélanger); *B.livida* (Reeve); *B.tenuis* (Reeve); *Buccinanops moniliferus* (Kiener).

Group 3: Ovoviviparous mode of development with miniature snails retained within the female's body. Examples: *Nassarius muelleri* (v. Maltzan); *N.elatus* (Gould); *N.cabrierensis ovoideus* (Locard); *N.albus* of authors (non Say); *N.scissuratus* (Dall); *N.striatus* (C. B. Adams); *N.tabescens* (Marrat); *Bullia nuttalli* (Kilburn).

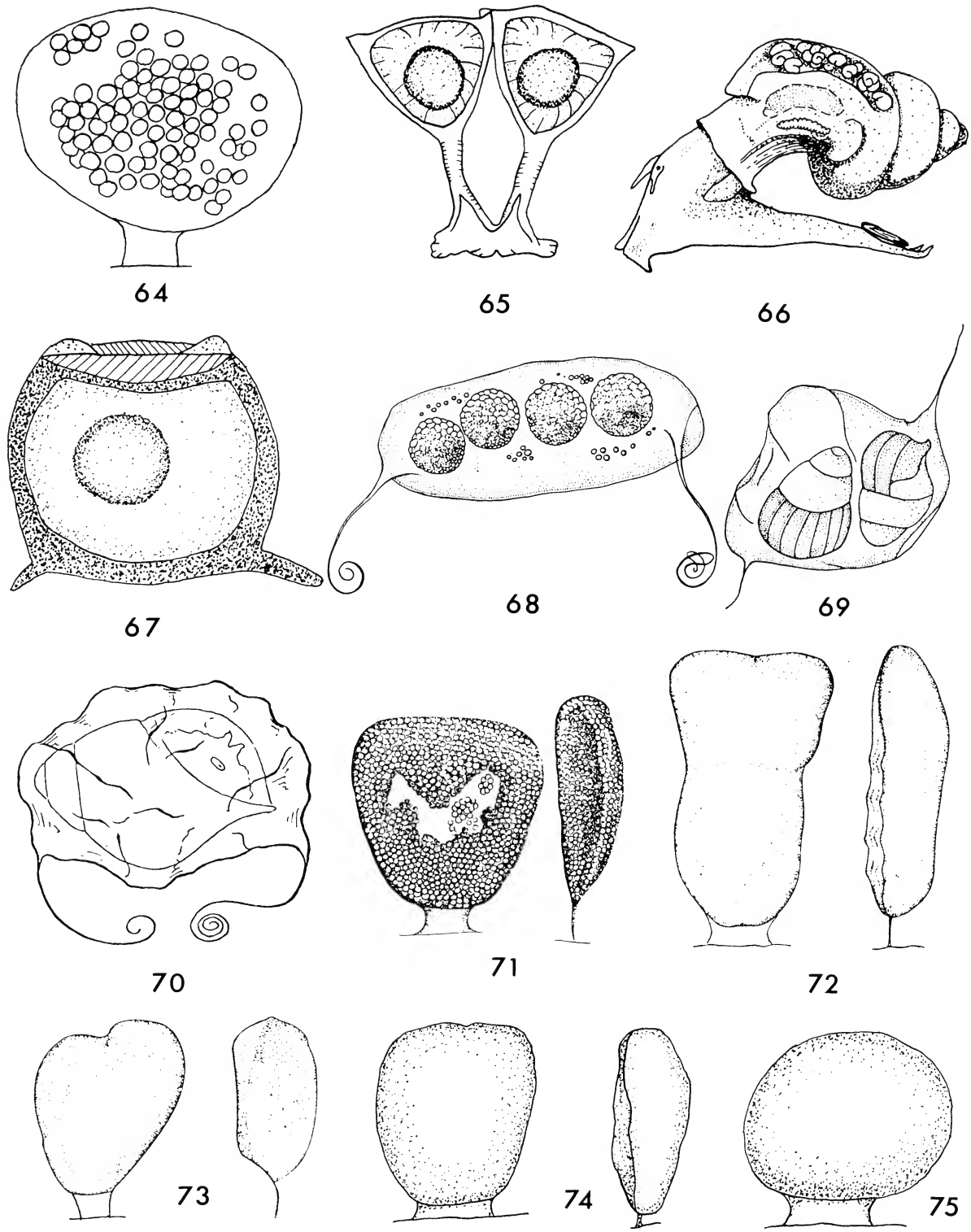
It is not certain if nassarid spawns are highly variable within the same species or if reports have at times been based on misidentifications. The egg-capsules of the West American *Nassarius tiarula* (Kiener) have been reported as slender vasiform, with a long and slender basal stalk by Houston (1978), whereas Skoglund (1977) shows the egg-capsules of the same species to be broad and vasiform without a stalk and sitting on a basal membrane. The egg-capsules of *N.vibex* (Say) drawn by Scheltema (1962) show regularly vasiform capsules on a slender, moderately long stalk. The egg-capsules of the same species examined by Bandel (1976) show a broad, rounded capsule which is narrow at the top and



Figs. 46-54. Egg-capsules of Nassariidae (front and lateral view). 46. *Nassarius nodicinctus* (A.Adams) [as *N.angulicostis*]. 47. *N.iodes* (Dall). 48. *N.taeniolatus* (Philippi). 49. *N.brunneostomus* (Stearns). 50. *N.tiarula* (Kiener) [all after Skoglund, 1977]. 51. *N.tiarula* (Kiener) [after Houston, 1978]. 52. *N.albus* (Say). 53. *N.vibex* (Say) [both after Bandel, 1976]. 54. *N.vibex* (Say) [after Scheltema, 1962].



Figs. 55-63. Egg-capsules of Nassariidae (front and lateral view) ctd. 55. *Nassarius obsoletus* (Say) [after Scheltema, 1962]. 56. *N.trivittatus* (Say) [after Robertson, 1976]. 57. *N.reticulatus* (Linnaeus) [after Thorson, 1946]. 58. *N.incrassatus* (Stroem) [after Lebour, 1931]. 59. *N.pygmaeus* (Lamarck) [after Thorson, 1946]. 60. *N.festivus* (Powys). 61. *N.livescens* (Philippi) [both after Amio, 1957]. 62. *N.castus* (Gould). 63. *N.pullus* (Linnaeus) [both after Natarajan, 1958].



Figs. 64-75. Egg-capsules of Nassariidae ctd. 64. *N.jacksonianus* (Quoy & Gaimard) [after Amio, 1957]. 65. *N.glans particeps* (Hedley) [after Anderson, 1966]. 66. *N.albus* (Say) [after Kaicher, 1972]. 67. *Cyclope neritea* (Linnaeus) [after Gomoiu, 1964]. 68,69. *Bullia melanoides* (Deshayes in Bélanger). 68. Egg-capsule. 69. Egg-capsule with 2 juvenile shells. 70. *B.tenuis* (Reeve). Egg-capsule with 2 juvenile shells [after Barnard, 1959]. 71. *Buccinanops moniliferum* (Kiener). 72. *B.gradatum* (Deshayes) [= ? *B.cochlidium* Dillwyn]. 73. *B.duartei* Klappenbach. 74. *B.globulosum* (Kiener). 75. *B.deforme* (King & Broderip) [all after Penchaszadeh, 1971a and 1971b].

lacks a stalk and sits on a broad basal membrane. Similarly Bandel (1976) reported *N.albus* (Say) from the Caribbean coast of Colombia as laying egg-capsules in the sea on a hard substrate and subsequent hatching after 6 days when free-swimming veliger larvae are released. Kaicher (1972) and Cather (1973a, 1973b) report specimen from Bermuda to be ovoviviparous. If misidentifications can be positively excluded, then the life histories of some species of Nassariidae are prone to change due to environment or salinity, as in other families. Rasmussen (1944) mentions that the same species can have two rather different modes of development: a totally non-pelagic one and a typically pelagic one. This is known in *Nerita catena* (da Costa), *Planaxis sulcatus* (Born) and other species.

The following authors have reported on oviposition and larval development: Lamy (1928); Ankel (1929); Lebour (1931); MacGinitie (1931); Risbec (1935); Vestergaard (1935); Rasmussen (1944); Thorson (1946); Jorgenson (1952); Amio (1957); Natarajan (1958); Morton (1960); Scheltema (1962, 1965); Christiansen (1964); Anderson (1966); Golikov & Scarlato (1967); Ansell & Trevallion (1970); Penchaszadeh (1971a, 1971b); Soderi (1975); Bandel (1975, 1976); Skoglund (1977); Houston (1978) and Thiriot-Quivreux (1980).

CLASSIFICATION OF NASSARIIDAE

The Linnaean species of Nassariidae were originally contained in the Linnaean genus *Buccinum* until the close of the 18th century when the genus-group *Nassa* Lamarck, 1799, was proposed. Subsequently the family-group name Nassidae was adopted in the middle of the 19th century and persisted in usage to about 1916 when the homonymous *Nassa* Lamarck, 1799 (non Roeding, 1798 in Muricidae) was replaced with *Nassarius* Duméril, 1806; the family-group name Nassariidae Iredale, 1916, was adopted early in the 20th century. The existence of several chronologically prior family-group names for Nassariidae necessitated an application to the International Commission on Zoological Nomenclature for the conservation of Nassariidae Iredale, 1916 (Cernohorsky 1972b, 1974a). The Commission's decision is still pending.

Linnaeus (1758) described 7 species of Nassariidae in his broad genus *Buccinum* which contained species of such diverse families as Harpidae, Tonnidae, Cassidae, Muricidae, Terebridae, Buccinidae and Nassariidae. Risso (1826) addeded several new species which he described in the genus *Planaxis* and *Cyclope*. A. Adams (1852-53) published a full list of the then known species of Nassariidae and described 92 species as being new to science. It was not until Reeve (1853-54), however, that the first illustrated monograph of the family appeared. G. B. Sowerby did not monograph the Nassariidae in his "Thesaurus Conchyliorum", but he did describe and illustrate species of the genus *Cyllene* (1859). Fischer (1875) catalogued the species of the genus *Cyllene* and shortly thereafter catalogues by Kobelt (1877a, 1877b, 1882) dealing with living species of *Bullia, Cyllene* and *Demoulia* appeared. The second and also last monograph of living species of Nassariidae was published by Tryon (1882), but this, like most of Tryon's monographs, suffered from indiscriminate lumping of even unrelated species.

Accounts of Nassariidae from restricted geographical regions have appeared from time to time in various Journals: Nassariidae from the Philippines (Mari 1934); Indo-China (Marche-Marchad 1955); South Africa (Tomlin 1928; Barnard 1959); Red Sea (Bisacchi 1930); Australia and New Zealand (Cernohorsky 1981a); general Indo-Pacific (Cernohorsky 1972a); West coast of America (Demond 1951, 1952; Keen 1971; Cernohorsky 1975a; Kaicher 1982); West Atlantic-Caribbean region (Abbott 1974; Cernohorsky 1975a; Kaicher 1982); Europe and East Atlantic (Nordsieck 1968; Adam 1976; Adam & Glibert 1974, 1976; Cernohorsky 1975a). Carcelles and Parodiz (1939) monographed the subfamily Dorsaninae of Uruguay and Argentina.

During nassarid taxonomy's 225 year history, a total of 2,442 names have been proposed, 1,323 for Recent and 1,119 for fossil species. From these names, approximately 319 are considered applicable to living species and 584 to fossil species; the latter figure is unusually high and is inflated by the number of taxa proposed by Bellardi (1882) for European Mio-Pliocene species, most of which will prove to be superfluous synonyms once the type material is evaluated. The taxonomic status of names proposed for Nassariidae are given in Table 1. The synonymic ratio for living species is 1 valid taxon for every 4 synonyms, which is comparable with a similar synonymic ratio in the families Mitridae and Costellariidae evaluated by the present author. European species of Nassariidae show their usual excess of naming with a synonymic ratio of 1:40 for *Nassarius mutabilis* (Linnaeus), 1:37 for *Cyclope neritea* (Linnaeus), 1:31 for *Nassarius cuvierii* (Payraudeau), 1:28 for *N.corniculus* (Olivi) etc.

TABLE 1. TAXONOMIC STATUS OF PROPOSED BINOMIAL TAXA IN THE FAMILY NASSARIIDAE.

Species	Recent	Fossil	Total
Primary and secondary homonyms	317	142	459
Objective and subjective synonyms	609	320	929
Nomina dubia	50	2	52
Non nassarid taxa	26	71	97
Suppressed names and nomina oblita	2	–	2
Tentatively valid names	319	584	903
Total number of proposed names	1323	1119	2442

H. & A. Adams (1853-58) proposed the first supraspecific subdivision of the Nassariidae, considering the subfamily Nassinae (based on *Nassa* Lamarck, 1799 – non Roeding 1798) to be a subfamily of the Buccinidae, and listing 33 genus-groups in the Nassinae, with 10 of these genera being non-nassarid. In the same publication the authors proposed 11 new generic groups for the Nassariidae. Thiele (1929) proposed 4 generic and 31 subgeneric groups for Recent Nassariidae while Wenz (1943) recognised 25 genera and 25 subgenera for both fossil and Recent Nassariidae.

Shuto (1969) proposed a generic arrangement of Nassariidae based on the operculum, presence or absence of the intermediate accessory lateral plate, presence or absence of metapodial tentacles, a smooth or carinate protoconch and mode of oviposition.

Considerable attention has been given to Shuto's proposed arrangement but it has been found unworkable in a taxonomic arrangement based on criteria listed by Shuto. The operculum in *Bullia*, subfamily Dorsaninae, and some species of *Nassarius*, subfamily Nassariinae, can be either serrate or simple, and in *N.granifer* (Kiener) individuals with both types of opercula have been encountered. The great variability of shape and serrations of the operculum prevent usage as a taxonomic feature.

The presence or absence of the accessory lateral plate is also an unreliable indication. *Nassarius kraussianus* (Dunker) is on morphological grounds an undoubted member of *Plicarcularia* Thiele, yet the radula lacks the accessory lateral plate which is usually present in species of this subgenus. Some species of *Zeuxis* do have an accessory lateral plate while others do not. In the 2 known species of the genus *Hebra*, one species has the plate while the other has not. Both *Nassarius (Ilyanassa) obsoletus* (Say) and *N.(Gussonea) corniculus* (Olivi) lack metapodial tentacles, yet the two species are in no way related. On the other hand, species of such diverse genus-groups as *Cyclope, Hima, Phrontis* etc., have animals with paired metapodial tentacles. Smooth and carinated protoconchs are distributed at random in the various genus-groups and utter confusion would result in using protoconch characters in a nassarid generic arrangement. The species *Nassarius (Hima) incrassatus* (Stroem), *N.(Hinia) reticulatus* (Linnaeus) and *N.(Ilyanassa) obsoletus* (Say), all have egg-capsules with numerous eggs, and embryos hatch as pelagic, planktotrophic veligers. These 3 species despite a similar mode of development belong to 3 different subgeneric groups.

In this account, the genera *Bullia, Buccinanops* and *Dorsanum* have been accepted in the subfamily Dorsaninae, the genus *Cyllene* in the subfamily Cylleninae, and the genera *Nassarius, Hebra, Demoulia* and 11 subgenera have been utilised for Indo-Pacific Nassariinae. Out of a total of 98 proposed genus-group names, only about 40% have been retained.

DISTRIBUTION

The Nassariidae have a moderately long geologic history, with the Dorsaninae dating back to the Paleocene where *Desorinassa* evolved from a buccinid ancestor. The Cylleninae and Nassariinae are considerably younger, and species recognizable as belonging to the Nassariinae are from Lower Miocene deposits. Species reported as Nassariinae from Oligocene or older deposits are all badly preserved and most probably belong to the Buccinidae. The Nassariinae could have evolved from the Paleocene–Oligocene buccinid genus *Brachysphingus* Gabb, and the Cylleninae from the Eocene-

Oligocene *Colwellia* Nuttal & Cooper (*Molopophorus* of authors). During Miocene times, Nassariinae species, particularly those of the subgenus *Hima* were widely distributed throughout Europe, the Americas, India, Indonesia and Japan, but no Miocene species are known from the Pacific area apart from the single *Hima* species known from the Australian and New Zealand Miocene, indicating a late arrival in the Pacific basin. Most Pliocene species of Indonesia are specifically inseparable from Recent species.

A comparison of fossil records with Recent species (Table 2) shows that approximately the same number of species are still living on the Pacific coast of America as have been during Mio-Pliocene times. In the Caribbean-West Atlantic region and the Mediterranean-East Atlantic faunal province, the number of species has declined since Mio-Pliocene times, and only in the tropical Indo-Pacific the number of living species has more than trebled. In addition to the 40 living West American species, 2 species have been introduced from the West Atlantic and Japan. The 23 West Atlantic-Caribbean species include 9 species of Dorsaninae endemic to the S.E. coast of South America. Fourteen species of Nassariidae are endemic to the Austral-Neozelanic faunal region.

TABLE 2. GEOGRAPHICAL DISTRIBUTION OF NASSARIIDAE SPECIES.

	Miocene	Mio-Pliocene	Pliocene	Recent
Pacific coast of America	20	7	16	40 (+ 2 introduced)
West Atlantic – Caribbean	65	–	13	23 [1]
Europe and East Atlantic coast		384 [2]		53 [3]
Indo-Pacific		64		211 [4]

1) Includes 9 species of Sth. American Dorsaninae
2) Excludes 120 homonyms and 234 acknowledged synonyms and varietal names
3) Includes 2 species of Cylleninae and 4 species of Dorsaninae
4) Includes 32 species of Dorsaninae

III. SYSTEMATICS

CLASS GASTROPODA

SUBCLASS PROSOBRANCHIA

ORDER **NEOGASTROPODA**

SUBORDER RACHIGLOSSA Gray, 1853

Superfamily BUCCINACEA Rafinesque, 1815

Family **NASSARIIDAE** Iredale, 1916

[Validation of the family name is pending with ICZN – No. Z.N.(S.) 1893]

1840. Nassinae Swainson, Treat.Malac. pp.63, 69, 299 (not available – art. 39 of ICZN) [based on *Nassa* Lamarck, 1799 – non Roeding, 1798.]
1859. Cyclopsidae Chenu, Man. Conchyl. 1:164 (not available – art.39 of ICZN) [based on *Cyclops* Montfort, 1810 – non Mueller, 1776].
1871. Cyclonassinae Gill, Smithsonian Misc.coll. 10:5 (based on *Cyclonassa* Swainson, 1840 = synonym of *Cyclope* Risso, 1826).
1882. Cylleninae Bellardi, Mem.R.Accad.Sci.Torino 34:159 (based on *Cyllene* Gray in Griffith & Pidgeon, 1834).
1901. Dorsaninae Cossmann, Essai paléoc. comp. 4:195,197 (Based on *Dorsanum* Gray, 1847).
1908. Alectrionidae Dall, Mus.Comp.Zool.Harvard Bull. 43:306 (based on *Alectrion* Montfort, 1810 = subgenus of *Nassarius* Duméril, 1806).
1915. Arculariidae Iredale, J.Conch. 14:345 (based on *Arcularia* Link, 1807 = synonym of *Nassarius* Duméril, 1806).
1916. Nassariidae Iredale, Proc.Malac.Soc.Lond. 12:82 (based on *Nassarius* Duméril, 1806).

Shell small to moderate in size, 4.0 – 75.0 mm in length, fusiformly-elongate to broadly ovate and occasionally rotund, teleoconch of 3-8 convex, straight-sided and sometimes angulate whorls, protoconch of 1½-4 smooth or finely keeled, globose or cylindrical embryonic whorls. Surface rarely smooth and usually sculptured with axial ribs, nodes, granules, spines, spiral cords, grooves or striae; sutures distinct or obsolete, canaliculate in some species.

Aperture wide or narrow, outer lip usually thickened and frequently variced, denticulate or simple on the edge, labrum occasionally with short or long lirae; columella either smooth, denticulate basally or along its entire length, some species with wrinkles or pustules. Siphonal canal either short or produced, siphonal notch very deep, siphonal fasciole with one or more cords. Most species are variegated with brown, reddish-brown or orange blotches, bands and lines. Operculum thin, corneous, and simple or serrate on the margin.

Animal with a large or very large foot which is anteriorly rounded and constricted at the sides into points, posterior of foot either truncate or concavely excavated, and usually with 2 long or short metapodial tentacles; some species have only a single tentacle while others have none at all. Tentacles long and slender or short and stubby, eyes present or absent, and when present are simple, unicoloured pupils situated at the broad base of the tentacles, proboscis long or short. Radula rachiglossate, typically Buccinacean, consisting of 3 teeth per row and occasionally with an additional small, ovate interposing plate.

HABITAT. In mud, sand, shell and coral debris, from the intertidal zone to a depth of *c.* 2000 metres.

GEOGRAPHICAL DISTRIBUTION. Cosmopolitan. Tropical Indo-Pacific, Mediterranean, Caribbean and colder waters of the Atlantic Ocean and the North Sea.

STRATIGRAPHICAL RANGE. Paleocene to Recent.

Nassariidae are primarily carnivorous but some species are deposit feeders, while *Nassarius (Ilyanassa) obsoletus* (Say), although a preferential carrion feeder, will also subsist on algae and detritus.

On the basis of anatomy, shell-morphology and geographical distribution, the family is divided into the subfamily Dorsaninae, Nassariinae and Cylleninae. Radular and morphological characters are shown for Dorsaninae in Figs. 76-100, for Nassariinae in Figs. 1-45 and for Cylleninae in Figs. 169-173.

Subfamily **DORSANINAE** Cossman, 1901

1901. Dorsaninae Cossman, Essai paléoc. comp. 4:197

GEOGRAPHICAL DISTRIBUTION. Recent in the Indian Ocean, South and West Africa and the East coast of South America. Fossil in Europe and the United States.

STRATIGRAPHICAL RANGE. Paleocene to Recent.

The subfamily contains 9 genus-groups, 5 of which have been based on living species and 4 on fossil species, and approximately 47 living species. Species of *Bullia s.str.* are known from South Africa and the Indian Ocean, species of the genus *Buccinanops* live on the east coast of South America (Brazil to Tierra del Fuego) and species of *Dorsanum* are confined to West Africa. *Dorsanum* is also known from Upper Eocene deposits of Peru (i.e. *D.parinense* Olsson, 1928), and species are also well represented in Mio-Pliocene deposits of Europe. Although species of *Desorinassa* are primarily known from Paleocene to Eocene deposits of Europe, one species, i.e. *D.calli* (Aldrich, 1886) is known from Eocene deposits of Alabama, United States. Species of *Bulliopsis* Conrad, 1862, a genus which appears to be related to *Bullia*, are known from Miocene deposits of the N.E. United States.

CHECK-LIST OF GENERIC GROUPS IN DORSANINAE

Genus *Bullia* Gray in Griffith and Pidgeon, 1834

Subgenus *Bullia* Gray in Griffith and Pidgeon, 1834

Bullia Gray in Griffith & Pidgeon, 1834, Anim.Kingdom Bar.Cuvier, Moll. & Radiata 12:pl.37, fig.8. Type species by M *B.semiplicata* Gray in Griffith & Pidgeon, 1834 = *Buccinum callosum* Wood, 1828. Recent, South Africa.

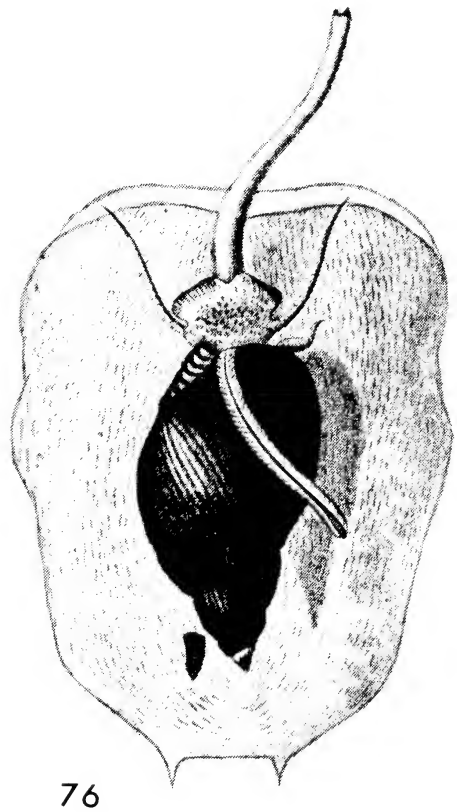
1840. *Leiodomus* Swainson, Treat.Malac. pp.69,74,302. Type species by SD (Gray, 1847) *Buccinum vittatum* Linnaeus, 1767. Recent, Indian Ocean.

1842. *Bulliana* M.E.Gray, Figures Moll. Animals 1:12 (misspelling of *Bullia* Gray in Griffith & Pidgeon, 1834).

1852. *Pseudostrombus* Moerch, Cat.Conchyl.Yoldi 1:77. Type species (here designated) *Buccinum vittatum* Linnaeus, 1767. Recent, Indian Ocean.

GEOGRAPHICAL DISTRIBUTION. Recent in South Africa and the western Indian Ocean.

The animal is very large, the posterior of the foot has 2 metapodial tentacles, the head-tentacles are long and slender, eyes are absent. The operculum is frequently very small and has smooth or serrate margins (Figs.76,77).



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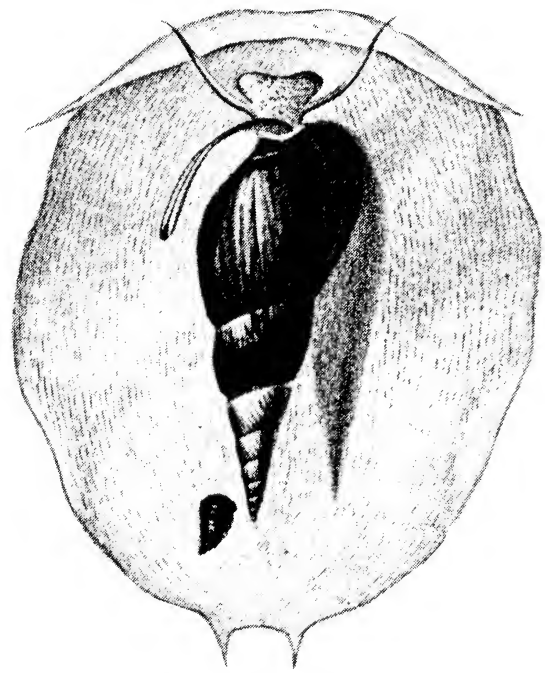

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Figs. 76,77. Animals of Dorsaninae. 76. *Bullia laevissima* (Gmelin). 77. *B.digitalis* (Dillwyn) [after Quoy & Gaimard, 1833].

Egg-capsules contain many eggs but only 1-2 develop. Development is direct and young hatch as crawling miniature shells. The species *Bullia nuttalli* Kilburn, 1978, from Mozambique is ovoviviparous (Kilburn 1978).

About 34 species of *Bullia s.lato* live in South Africa and the western Indian Ocean.

Subgenus *Cereobullia* Melvill and Peile, 1924

Cereobullia Melvill & Peile, 1924, Proc.Malac.Soc.Lond. 16:138. Type species by OD *Bullia ceroplasta* Melvill, 1898. Recent, Persian Gulf.

GEOGRAPHICAL DISTRIBUTION. Persian Gulf.

The shell differs from *Bullia* in its waxen appearance and wide, longitudinal ribs (Fig. 93). The operculum has a squared notch basally and 4 slender spines on the left margin. The radula differs from *Bullia*, especially the rachidian tooth (Fig.86).

Genus *Buccinanops* d'Orbigny, 1841

Buccinanops d'Orbigny, 1841, Voy.Amer.merid. Moll. p.434. Type species by SD (Herrmannsen, 1846) *Buccinum cochlidium* Dillwyn, 1817. Recent, S.E. coast of South America.

GEOGRAPHICAL DISTRIBUTION. Recent, S.E. coast of South America. Fossil from Tertiary deposits of Tierra del Fuego and Graham Land, Antarctica.

The shell and animal are closely similar to *Bullia* but the base of the columella has an oblique plait (Figs.94,95). The radula is also similar to *Bullia* (Figs.78,79). Egg-capsules contain numerous eggs but most are used as nurse-eggs and only very few, sometimes only a single egg, will develop (Figs. 71-75). In *B.moniliferum* (Kiener) development is direct and young hatch as miniature crawling shells.

About 9 species live in South America.

Genus *Dorsanum* Gray, 1847

Subgenus *Dorsanum* Gray, 1847

Dorsanum Gray, 1847, Proc.Zool.Soc.Lond. p.139. Type species by OD *Buccinum politum* Lamarck, 1822 (non Roeding, 1798) = *B.miran* Bruguiére, 1789. Recent, West Africa.

GEOGRAPHICAL DISTRIBUTION. Recent, West Africa. Fossil from Mio-Pliocene deposits of Europe.

The animal lacks metapodial tentacles, head-tentacles are short but eyes are present. The shell is aso appreciably different to *Bullia* (Figs. 96,97). Egg-capsules contain many eggs and young hatch as pelagic veliger-larvae. The radula differs from *Bullia* and *Buccinanops*, especially the lateral teeth which are always bicuspid (Figs.80,81).

Only 4 species of *Dorsanum s.lato* are known from West Africa.

Subgenus *Fluviodorsum* Boettger, 1885

Fluviodorsum Boettger, 1885, Ber.Offenbach Ver.Naturk. 24/25:188. Type species by OD *Bullia fusca* Craven, 1882 (non Gray in Dieffenbach, 1843) = *Terebra granulosa* Lamarck, 1822. Recent, West Africa.

GEOGRAPHICAL DISTRIBUTION. Recent, Congo, West Africa.

The type-species differs from *Dorsanum s.str.* in its terebriform shape, very short aperture and long and slender spire whorls. The periostracum is thin and finely spirally striate (Figs.98-100). The radula is similar to *Dorsanum s.str.* (Fig.81).

Genus *Bulliopsis* Conrad, 1862

Bulliopsis Conrad, 1862, Proc.Acad.Nat.Sci.Philadelphia p.287. Type species by SD (Cossmann, 1909) *Buccinum integrum* Conrad, 1842 (non Schroeter, 1805) = *Bullia (Bulliopsis) ovata* Conrad, 1862. Miocene of Maryland, U.S.A.

GEOGRAPHICAL DISTRIBUTION. Miocene of the N.E. United States.

Genus *Desorinassa* Nuttall and Cooper, 1973

Desorinassa Nuttall & Cooper, 1973, Bull.Brit.Mus. (Nat.Hist.), 23(3):201.

Type species by OD *Buccinum desori* Deshayes, 1865. Paleocene of Europe.

GEOGRAPHICAL DISTRIBUTION. Paleocene to Lower Eocene of Europe and Eocene of Alabama, U.S.A.

The species *Nassa calli* Aldrich, 1886, from the Eocene of Alabama, agrees extremely well with species of *Desorinassa*.

Genus *Ambullina* Palmer, 1937

Ambullina Palmer, 1937, Bull.Americ.Paleont. 7:292. Type species by OD *Ancillaria ancillopsis* Heilprin, 1890. Eocene of Texas.

GEOGRAPHICAL DISTRIBUTION. Eocene of N.E. United States.

? Genus *Lisbonia* Palmer, 1937

Lisbonia Palmer, 1937, Bull.Americ.Paleont. 7:294. Type species by OD *Ancillaria expansa* Aldrich, 1886. Eocene of Alabama.

GEOGRAPHICAL DISTRIBUTION. Eocene of N.E. United States.

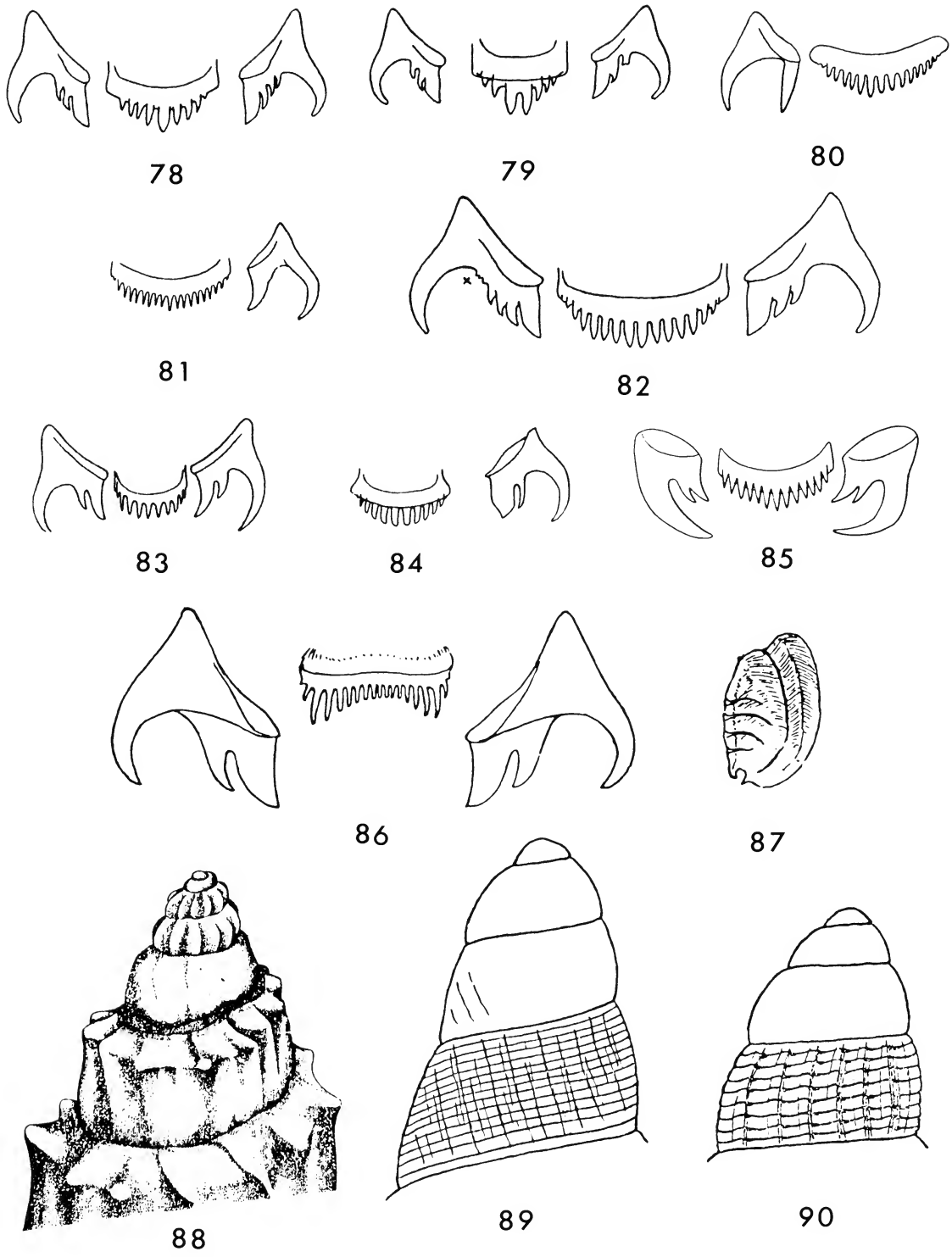
This genus is only doubtfully included in the Dorsaninae.

GENERA EXCLUDED FROM THE DORSANINAE

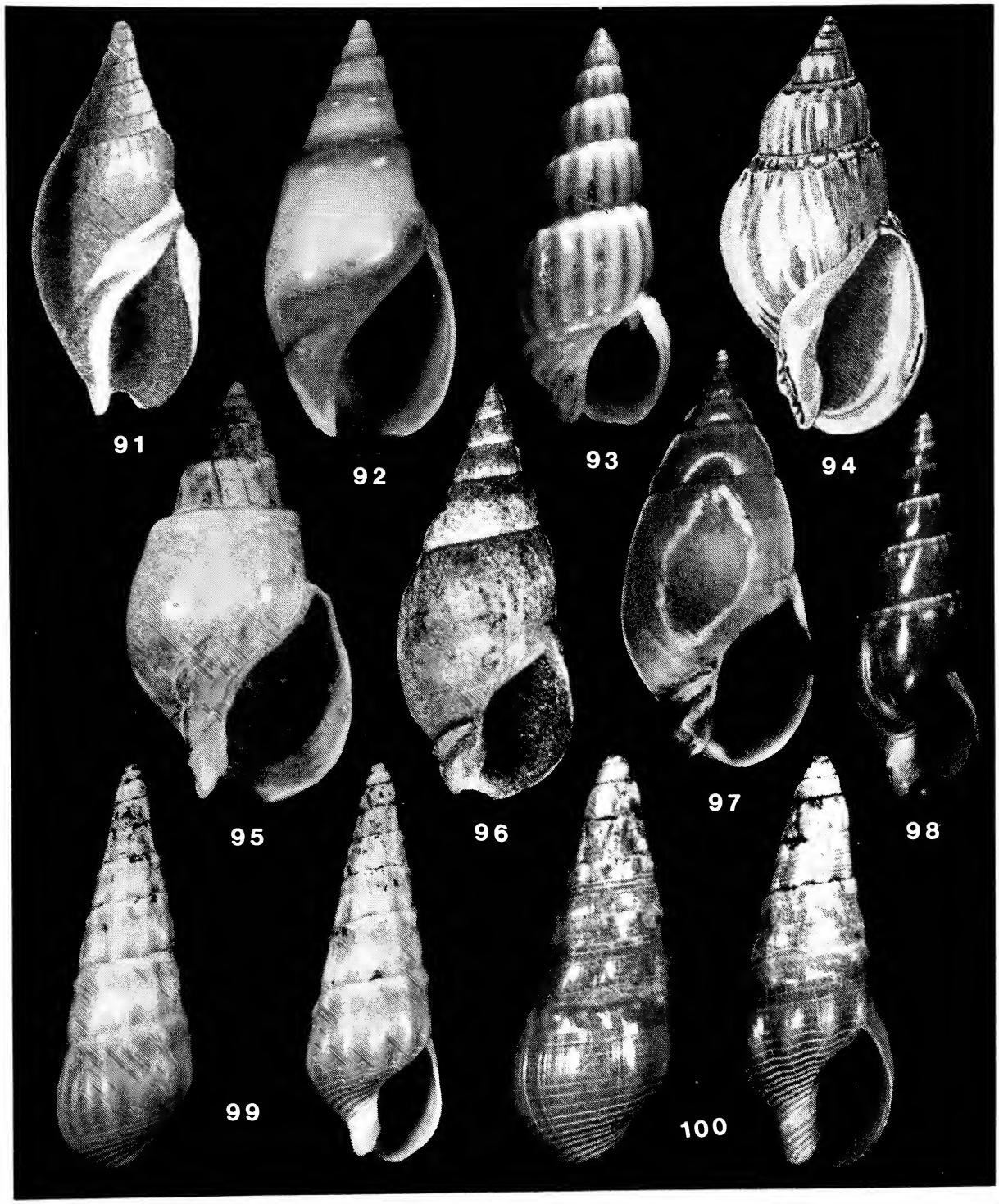
Genus *Adinus* H. and A. Adams, 1853

Adinus H. & A. Adams, 1853, Gen.Rec.Moll. 1:114. Type species by M *Bullia truncata* Reeve, 1846. Recent, ? Indian Ocean.

GEOGRAPHICAL DISTRIBUTION. The distribution of Recent species is unknown. The genus occurs fossil in Indonesia.



Figs. 78-90. Radulae and protoconchs of Dorsaninae. 78. *Buccinanops globulosum* (Kiener). 79. *B.gradatum* (Deshayes). 80. *Dorsanum miran* (Bruguière). 81. *D.terebraeforme* Dautzenberg. 82. *Bullia laevissima* (Gmelin). 83. *B.annulata* (Lamarck). 84. *B.pura* Melvill (all after Peile, 1937). 85. *B.digitalis* (Dillwyn) [after Troschel, 1867]. 86,87. *B. (Cereobullia) ceroplasta* Melvill. 86. Radula. 87. Operculum (after Melvill & Peile, 1924). 88. *Buccinanops moniliferum* (Kiener) [after Penchaszadeh, 1971a]. 89. *Bullia natalensis* (Krauss). 90. *B.mozambicensis* E. A. Smith [after Barnard, 1959].



Figs. 91-100. Type-species of genera of living Dorsaninae. 91,92. *Bullia callosa* (Wood). 91. Type-figure of *B.semiplicata* Gray (from Griffith & Pidgeon, 1834, pl.37*, fig.8). 92. Specimen from Jeffrey's Bay, Sth. Africa; 37.1 mm. 93. *B. (Cereobullia) cereoplasta* Melvill. Mekran, Arabian Sea; 13.5 mm. 94,95. *Buccinanops cochlidium* (Dillwyn). 94. Type-figure from Martini & Chemnitz (1795, pl.209, fig.2054). 95. Specimen from Monte Hermoso, Argentina; 61.5 mm. 96,97. *Dorsanum miran* (Bruguière). 96. Syntype ex-Adanson coll. MNHNP (from Fischer-Piette, 1942, pl.2, fig.8b; 29.0 mm). 97. Syntype of *Buccinum politum* Lamarck MNHG No. 1101/99; 26.9 mm. 98. *Dorsanum (Fluviodorsum) granulosum* (Lamarck) [Holotype of *Bullia fusca* Craven, BM(NH); 24.0 mm]. 99,100. *D. (F.) terebraeformis* Dautzenberg; Baié de Mossamedes, Angola, West Africa. 99. Syntype Inst.R.Sci.Nat.Belg.,Brussels No. I.G.-10591; 21.7 mm. 100. Recent specimen, AMS; 14.7 mm.

Shells of *Adinus* are terebriform, with a long body whorl and short aperture, embryonic whorls are paucispiral and the shell is sculptured with minutely punctate spiral grooves. The outer lip is denticulate and protruding past the columella which is calloused, concave and denticulate-plicate and truncate at the base (Fig. 101). The animal is unknown.

The living species *Adinus truncatus* (Reeve), remains unlocalised at the time of writing and 4 fossil species are known from the Indonesia Tertiary. It is probable that *A. truncatus* still lives in the Indonesian region rather than South Africa. The familial placement of *Adinus* is uncertain and it may prove to belong to the Buccinidae.

Genus *Brachysphingus* Gabb, 1869

Brachysphingus Gabb, 1869, Geol.Surv.Calif.Paleont. 2:155. Type species by SD (Cossmann, 1901) *B.sinuatus* Gabb, 1869. Eocene of California.

I agree with Nuttall & Cooper (1973) that the type-species is non-nassarid.

Genus *Colwellia* Nuttall and Cooper, 1973

Colwellia Nuttall & Cooper, 1973, Bull.Brit.Mus. (Nat.Hist.), Geol. 23(3):208. Type species by OD *Cominella flexuosa* Edwards in Lowry *et.al.*, 1866. Upper Eocene of England.

GEOGRAPHICAL DISTRIBUTION. Eocene of Europe and U.S.A.; ? Oligocene of Japan.

Species of *Colwellia* are conchologically more closely related to the photine buccinid genus *Cominella* Gray, 1850, rather than the Nassariidae. The genus *Colwellia* is supposed to include species previously placed in *Molopophorus* Gabb, 1869.

Genus *Expleritoma* Aldrich, 1886

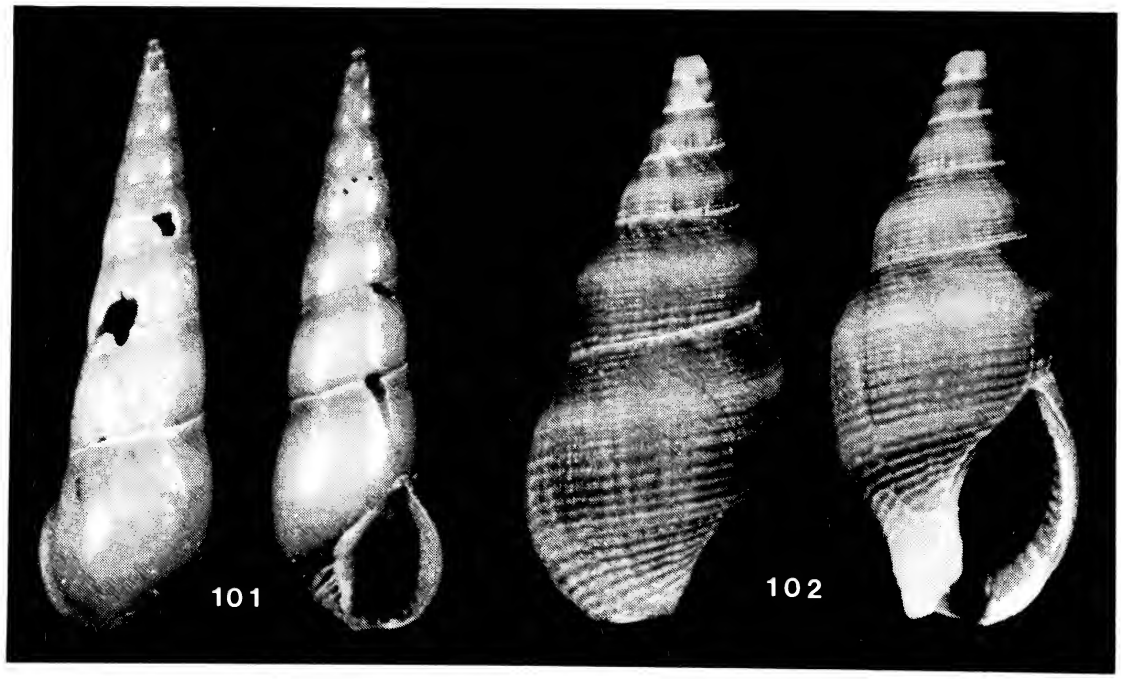
Expleritoma Aldrich, 1886, Geol.Surv.Alabama Bull. No.1:28. Type species by M *E.prima* Aldrich, 1886. Eocene of Alabama.

The type species of *Expleritoma* resembles a naticoid far more closely than any genus of Nassariidae.

Genus *Molopophorus* Gabb, 1869

Molopophorus Gabb, 1869, Geol.Surv.Calif.Paleont. 2:156. Type species by M *Bullia (Molopophorus) striatus* Gabb, 1869. Eocene of California.

The genus has been based on an imcomplete individual and the species family affinities remain doubtful. Species subsequently placed in the genus usually belong to the photine Buccinidae. Nuttall & Cooper (1973) suggest that *Molopophorus* is synonymous with *Brachysphingus* Gabb, and further state that species usually assigned to *Molopophorus* actually belong to *Colwellia* Nuttall & Cooper, a buccinid genus containing Eocene and Oligocene species from Europe, the U.S.A. and tentatively Japan.



Figs. 101,102. Type-species of genera. 101. Type-specimen of *Adinus truncatus* (Reeve), BM(NH); 37.0 mm. 102. Paratype of *Adinopsis skoogi* Odhner, from Port Alexander, Angola, West Africa; 22.0 mm.

Genus *Monoptygma* Lea, 1833

Monoptygma Lea, 1833, Contrib.Geology p.185. Type species by SD (Cossmann, 1899) *M.alabamiensis* Lea, 1833 = *Ancillaria lymneoides* Conrad, 1833. Eocene of Alabama.

The type species and other related species have a single (rarely 2) strong folds on the centre of the columella and an extremely weak siphonal notch. *Monoptygma* lacks any characters which would suggest a relationship with the Dorsaninae.

Genus *Ragenella* Conrad, 1865

Ragenella Conrad, 1865, Americ.Journ.Conch. 1:21. Type species by M "*S.bellalvirata (sic)* Gabb", Conrad = *Phos bellaliratus* Gabb, 1861. Eocene of Alabama.

1865. *Sagenella* Conrad, Americ.J.Conch., unpaginated (nom.subst.pro *Ragenella* Conrad, 1865) [non *Sagenella* Hall, 1851].

The method of erection of the genus *Ragenella* has been complicated by the fact that the genus name has been originally spelled *Ragenella* and has later been emended to *Sagenella* in a two page list in the same Journal (Conrad 1865b). The emended name *Sagenella*, however, is a primary homonym of *Sagenella* Hall, 1851. Conrad (1865a) listed two species under *Ragenella*, i.e. "*S.bellalvirata* Gabb", which was a misspelling for *Phos bellaliratus* Gabb, 1861, and "*S.texana* C." which at the time of erection of *Ragenella* was a *nomen nudum*. Since only one single valid species-name has been cited under *Ragenella, Phos bellaliratus* should be accepted as the type of the genus by monotypy. *Ragenella* is more appropriately placed in the subfamily Photinae, family Buccinidae.

Genus *Perunassa* Olsson, 1932

Perunassa Olsson, 1932, Bull.Americ.Paleont. 19(68):168. Type species by OD *Argobuccinum zorritense* Nelson, 1870. Miocene of Peru.

Perunassa was originally erected as a subgenus of the nassarid *Buccinanops* d'Orbigny, but was later placed by Olsson (1964) in the family Buccinidae where it rightly belongs.

Genus *Adinopsis* Odhner, 1923

Adinopsis Odhner, 1923, Goteborg Kungl.Vet.Handl. 26(7):15. Type species by M *A.skoogi* Odhner, 1923. Recent, West Africa.

Adinopsis Odhner, 1923, is a primary homonym of *Adinopsis* Cameron, 1918, in Coleoptera. This homonymous genus-group belongs in the subfamily Nassariinae and not the Dorsaninae (Fig.102).

Nuttall & Cooper (1973) also established the genera *Pseudocominella, Whitecliffia, Keepingia* and *Thanetinassa* for European fossil species from Paleocene to Lower Miocene deposits. The conchological features of the type species of these genera would indicate a placement in the family Buccinidae rather than the Nassariidae.

SYNONYMIC CHECK-LIST OF THE RECENT SPECIES OF DORSANINAE

Bullia (Bullia) aikeni Kilburn, 1978

1978. *Bullia aikeni* Kilburn, Ann.Natal Mus. 23(2):299, pl.2, figs.a,b (shell), textfig.1 left (radula) [Porto Amelia, Mozambique, E.Africa]

Bullia (Bullia) ancillaeformis E.A. Smith, 1906

1906. *Bullia ancillaeformis* E.A. Smith, Ann.Natal Mus. 1(1):37, pl.7,fig.8 (Port Shepstone, *c.*112 km Sth. of Durban, Natal, Sth.Africa).

Bullia (Bullia) annulata (Lamarck, 1816)

1816. *Buccinum annulatum* Lamarck, Tabl.Encycl.Meth. p.2, pl.399, figs.4a,b (No locality. = South Africa).

Bullia (Bullia) callosa (Wood, 1828)

1828. *Buccinum callosum* Wood, Ind.Test. Suppl. pp.12,31, pl.4,fig.14 (No locality. = South Africa).

1834. *Bullia semiplicata* Gray in Griffith & Pidgeon, Anim.Kingd.Bar.Cuvier, Moll. & Radiata 12:596, pl.37,fig.8 (No locality); 1839 Gray, Zool. Capt. Beechey's Voy. p.127.

1889. *Bullia callosa* var. *sulcata* Sowerby, J.Conch. 6:6 (Port Elizabeth, Sth.Africa) [non Reeve, 1847]

Bullia (Bullia) cataphracta Kilburn, 1978

1978. *Bullia cataphracta* Kilburn, Ann. Natal Mus. 23(2):301, pl.2,fig.d (shell), textfig. 1 on right (radula) [Baia dos Cocos, Jangamo District, Mozambique, E.Africa].

Bullia (Cereobullia) ceroplasta Melvill, 1898

1898. *Bullia ceroplasta* Melvill, 1898, Mem.Proc.Manchester Lit.Phil.Soc. 42:17, pl.2,fig.13 (Mekran coast Persian Gulf).

Buccinanops cochlidium (Dillwyn, 1817)

1817. *Buccinum cochlidium* Dillwyn, Desc.cat.Rec.shells 2:627 (ref.Chemnitz, Syst.Conchyl.-Cab., 11:275,figs.2053,2054) [Islands of the South Seas = error. S.E. coast of Sth.America.]

1834. *Buccinum lamarckii* Kiener, Spec.gen.icon.coq.viv. 9:5,pl.3,fig.6.

Bullia (Bullia) cumingiana Dunker, 1857

1857. *Bullia cumingiana* Dunker, Proc.Zool.Soc.Lond. Pt.24:355 (No locality. = Persian Gulf).

Buccinanops deforme (King & Broderip, 1832)

1832. *Buccinum deforme* King & Broderip, Zool.Journ. 5:349 (Sth.America).

For a description of the spawn of this species see Penchaszadeh (1971b).

Bullia (Bullia) digitalis (Dillwyn, 1817)

1817. *Buccinum digitale* Dillwyn, Desc.cat.Rec.shells 2:646 (ref.Chemnitz, Syst.Conchyl.-Cab. 4:310, pl.155,figs.1468, 1469 and pl.157, fig.1491) [Coast of Bombay and Coromandel = error. South Africa].
1816. *Buccinum achatinum* Lamarck, Tabl.Encycl.Meth. p.2, pl.400,figs.4a,b (No locality). [non Mueller, 1774].
1838. *? Buccinum elongatulum* Anton, Verz.Conchyl. p.91 (No locality).
1840. *Leiodomus quoyii* Swainson, Treat.Malac. 12:302 (ref. to Quoy & Gaimard, 1833, pl.31,fig.17). [Table Bay, Sth.Africa].
1846. *Bullia semiflammea* Reeve, Conch.Icon. 3:pl.3,sp.17 (No locality).
1846. *Bullia semiusta* Reeve, *ibid.* 3:pl.4,sp.22 (No locality).
1846. *Bullia sulcata* Reeve, *ibid.* 3:pl.4,sp.14 (No locality).
1885. *Bullia capensis* Euthyme, Bull.Soc.Malac.Franc. 2:237 (Sth.Africa).
1915. *Bullia almo* Bartsch, Bull.U.S.Nat.Mus. 91:54, pl.35,fig.4 (Port Alfred, Sth.Africa).
1921. *Bullia dulcis* Sowerby, Proc.Malac.Soc.Lond. 14:125, textfig. (Port Alfred, Sth.Africa).
1932. *Bullia soluta* "Gmelin",Turton, Mar.shells Pt.Alfred p.65,pl.15,fig.470 (Port Alfred, Sth.Africa).

Bullia (Bullia) diluta (Krauss, 1848)

1848. *Buccinum (Bullia) dilutum* Krauss, Sudeafrik.Mollusk. p.121 (coast of Natal, Sth.Africa).
1874. *Bullia diluta* var. *mediolaevis* v.Martens, Jahrb.deut.Malak.Gessell. 1:137, pl.6,fig.4 (False Bay, Sth.Africa).
1915. *Bullia aepynota* Bartsch, Bull.U.S.Nat.Mus. 91:53,pl.35,fig.5 (Port Alfred, Sth.Africa).
1915. *Bullia alfredensis* Bartsch, *ibid.* 91:54,pl.3,fig.2 (Port Alfred, Sth.Africa).
1932. *Bullia albanyana* Turton, Mar.shells Pt.Alfred p.62,pl.14,fig.452 (Port Alfred, Sth.Africa).
1932. *Bullia rietensis* Turton, *ibid.* p.62, pl.15, fig.456 (Port Alfred, Sth.Africa).
1932. *Bullia scitula* Turton, *ibid.* p.64,pl.15,fig.465 (Port Alfred, Sth.Africa).
1932. *Bullia spectrum* Turton, *ibid.* p.63, pl.15,fig.460 (Port Alfred, Sth.Africa).
1932. *Bullia subventricosa* Turton, *ibid.* p.63, pl.15,fig.459 (Port Alfred, Sth.Africa).
1932. *Bullia zenobia* Turton, *ibid.* p.62, pl.15,fig.457 (Port Alfred, Sth.Africa).

Buccinanops duartei Klappenbach, 1961

1961. *Buccinanops duartei* Klappenbach, Neotropica 7(24):87, figs.1a,b (La Coronilla, Depart. de Rocha, Uruguay).

Buccinanops globulosum (Kiener, 1834)

1834. *Buccinum globulosum* Kiener, Spéc.gen.icon.coq.viv. 9:12, pl.10,fig.33 (Sth.America).
1844. *Buccinum ampullaceum* Deshayes in Deshayes & Edwards, Hist.nat.anim.s.vert. ed.2, 10:203 (nom.subst.pro "*Buccinum globosum* Kiener" = error for *globulosum*) [non *B.ampullaceum* Borson, 1820].
1906. *Buccinanops globulosum* var. *elata* Strebel, Zool.Jahrb.Syst.Geog.Biol. 24(2):151, pl.11,figs.75a,b (Puerto Madryn, Magalhan Province, Sth.America).

For the description of spawn of this species see Penchaszadeh (1971b).

Buccinanops gradatum (Deshayes in Deshayes & Edwards, 1844)

1834. *Buccinum cochlidium* Kiener, Spéc.gen.icon.coq.viv. 9:10,pl.6,fig.17 (New Zealand = error; Sth.America) [non Dillwyn, 1817].
1844. *Buccinum gradatum* Deshayes in Deshayes & Edwards, Hist.nat.anim.s.vert. ed.2, 10:186 (nom.subst.pro *B.cochlidium* Kiener, 1834).
1907. *Bullia gradata pampeana* Ihering, Anal.Mus.Nac.Buenos Aires pp.422,425 (Pampeano de Puerto Belgrano, Sth.America).

After further study, this species may prove to be a form of *B.cochlidium* (Dillwyn, 1817). For description of spawns see Penchaszadeh (1971b).

Dorsanum (Fluviodorsum) granulosum (Lamarck, 1822)

1822. *Terebra granulosa* Lamarck, Hist.Nat.anim.s.vert. 7:291 (Seas of Senegal, W.Africa).
1883. *Bullia (Pseudostrombus) fusca* Craven, Ann.Soc.Malac.Belgique 17:16,pl.2,fig.1 (Landana, mouth of the Congo) [non *Bullia fuscus* Gray in Dieffenbach, 1843].

This is the type species of *Fluviodorsum* Boettger, 1885.

Dorsanum (Dorsanum) gruveli Dautzenberg, 1910

1910. *Dorsanum gruveli* Dautzenberg, Act.Soc.Linn.Bordeaux, p.56,pl.2,fig.7 (Bilaouak, West Africa).

Bullia (Bullia) indusindica Melvill, 1898

1898. *Bullia (Pseudostrombus) indusindica* Melvill, Mem.Proc.Manchester Lit. Phil.Soc. 42(2):18, pl.1,fig.19 (Karachi, Pakistan).

Bullia (Bullia) kurrachensis Angas, 1877

1877. *Bullia (Leiodomus) kurrachensis* Angas, Proc.Zool.Soc.Lond. p.529, pl.54,fig.6 (Manora Pt., Kurrachi, Scinde, N.W.India).

Bullia (Bullia) laevissima (Gmelin, 1791)

1789. *Buccinum flammeum* Bruguière, Encycl.Meth.Hist.Nat.vers 1:266 (ref. Chemnitz, Syst.Conchyl.-Cab. 4:pl.127, figs.1215,1216 ?) [No locality]. (non Linnaeus, 1767).
1791. *Buccinum laevissimum* Gmelin, Syst.Nat. ed.13:3494 (ref. Chemnitz, Syst.Conchyl.-Cab. 4:pl.127, figs.1215,1216 (No locality; South Africa).
1816. *Buccinum laevigatum* Lamarck, Tabl.Encycl.Meth. p.2,pl.400, figs.1a,b (No locality) [non Linnaeus, 1758].

Bullia (Bullia) mauritiana Gray, 1839

1839. *Bullia mauritiana* Gray, Zool.Capt. Beechey's Voy. p.126 (Madagascar).
1846. *Bullia grayi* Reeve, Conch.Icon. 3:pl.2, sp.7 (No locality).

Bullia (Bullia) melanoides (Deshayes in Bèlanger, 1832)

1832. *Buccinum melanoides* Deshayes in Bèlanger, Voy. Indes-Orientales p.430, pl.2, figs.3,4 (Ceylon = Sri Lanka).
1904. *Bullia (Pseudostrombus) strenaria* Melvill, Proc.Malac.Soc.Lond. 6:51, pl.5,fig.10 (Muscat, Persian Gulf, 13-27m).
1904. *Bullia (Pseudostrombus) strenaria* var. *melaleuca* Melvill, *ibid.* 6:52 (Galig I, Persian Gulf, 15 m).
1904. *Bullia (Pseudostrombus) strenaria* var. *plumbea* Melvill, *ibid.* 6:51 (Mekran coast, Persian Gulf).

Dorsanum (Dorsanum) miran (Bruguière, 1789)

1789. *Buccinum miran* Bruguière, Encycl.Meth.Hist.Nat.vers 1:268 (ref.Buonanni, 3:120,fig.60; Gualtieri, pl.44,fig.R; Adanson, p.50,pl.4,fig.1 etc.) [Senegal, West Africa].
1822. *Buccinum politum* Lamarck, Hist.nat.anim.s.vert. 7:269 (Senegal, W. Africa) [non Roeding, 1798].
1846. *Bullia vitrea* Reeve, Conch.Icon. 3:pl.3,sp.20 (No locality).

For the descriptions of spawns see Ansell & Trevallion (1970).

Buccinanops moniliferum (Kiener, 1834)

1834. *Buccinum moniliferum* Kiener, Spéc.gen.icon.coq.viv. 9:11, pl.3,fig.8 (Sth.America).
1839. *Bullia armata* Gray, Zool.Capt. Beechey's Voy. p.126 (No locality).

For the description of spawns see Penchaszadeh (1971a).

Bullia (Bullia) mozambicensis E.A.Smith, 1878

1878. *Bullia mozambicensis* E.A.Smith, Proc.Zool.Soc.Lond. for 1877:719, pl.75,fig.18 (Mouth of Makusi River, Quilimane, E.Africa).
1894. *Bullia pustulosa* Sowerby, J.Conch. 7:368 (Durban, Natal, Sth.Africa).

Bullia (Bullia) natalensis (Krauss, 1848)

1848. *Buccinum natalense* Krauss, Suedafrik.Mollusken p.121, pl.6,fig.16 (Natal, Sth.Africa).

Bullia (Bullia) nitida Sowerby, 1895

1895. *Bullia nitida* Sowerby, Proc.Malac.Soc.Lond. 1:278, pl.18,figs.3,4 (Mekran coast, Persian Gulf).

Bullia (Bullia) nuttalli Kilburn, 1978

1978. *Bullia nuttalli* Kilburn, Ann.Natal Mus. 23(2):301, pl.2,fig.C (Baia dos Cocos, Jangamo District, Mozambique, E.Africa).

Kilburn (1978) reports the species to be ovoviviparous.

Bullia (Bullia) osculata Sowerby, 1900

1900. *Ancilla osculata* Sowerby, Proc.Malac.Soc.Lond. 4:3, pl.1,fig.6 (Pondoland, Sth.Africa).

Bullia (Bullia) othaeitensis (Bruguière, 1789)

1788. *"Buccinum australe otaheitense"* Chemnitz, Syst.Conchyl.-Cab. 10:202, pl.154, fig.1477 (non binom.).
1789. *Buccinum othaeitense* Bruguiere, Encycl.Meth.Hist.nat.vers 1:257 (ref. Chemnitz, op.cit., pl.154, fig.1477) [Tahiti].
1791. *Buccinum tahitense* Gmelin, Syst.Nat. ed.13:3498 (ref. Chemnitz, op.cit. pl.154, fig.1477) [Tahiti].
1817. *Buccinum otaheitense* Dillwyn, Desc.cat.rec.shells 2:634 (ref. Chemnitz, op.cit., pl.154, fig.1477) [Otaheite].
1901. *Bullia (Pseudostrombus) taheitensis (sic)* Gmel., Melvill & Standen, Proc.Zool.Soc.Lond. 2:408.
1974. *Bullia taheitensis (sic)* Gray, Dance, Encycl. shells p.159, top.fig. p.160.
1981. *Bullia tahitensis* (Gmelin), Smythe & Chatfield, J.Conch. 30:376; 1982 D. Bosch & E. Bosch, Seashells of Oman, p.104, bottom figs.

Chemnitz (Martini & Chemnitz 1769-95) first described the species and credited Captain Cook with its discovery in Tahiti. His description of a "gray, somewhat bluish shell sporadically brown-spotted", combined with his illustration showing the interspaces of all spiral cords uniformly reddish-brown, does not conform to the colour-pattern of the *"tahitensis"* of authors. Chemnitz also states that "the inner lip is laid over the columella like a thick, shining white leaf", whereas *"tahitensis"* of authors lacks this feature altogether.

If really a true *Bullia*, then the type locality is erroneous, since *Bullia* does not live in the Pacific Ocean. Dance's (1974) indication of "Indo-Pacific" as the distribution of *"tahitensis"* is also erroneous since this species is confined to the Persian Gulf and Arabian Sea. Recent authors have adopted the name *Bullia tahitensis* and credited the authorship to either Gmelin or Gray, but the taxon *B.othaeitensis* (Bruguière) is chronologically prior and should be used for a taxon which cannot be unequivocally identified and could be considered a *nomen dubium* or *nomen inquirendum*.

Buccinanops paytense (Kiener, 1834)

1832. *Buccinum squalidum* King & Broderip, Zool.J. 5:349 (non Gmelin, 1791).
1834. *Buccinum paytense* Kiener, Spéc.gen.icon.coq.viv. 9:pl.6,fig.16 (Payta, Sth.America)
1846. *Buccinum citrinum* Reeve, Conch.Icon. 3:pl.9, sp.70 (No locality).

Bullia (Bullia) persica E.A.Smith, 1878

1878. *Bullia persica* E.A.Smith, Proc.Zool.Soc.Lond. p.730, pl.46,fig.11 (Bushire, Persian Gulf).

Bullia (Bullia) pura Melvill, 1885

1885. *Bullia pura* Melvill, J.Conch. 4:316, pl.11,fig.2 (Port Elizabeth, Sth.Africa).
1920. *Bullia tenuistriata* Tomlin, J.Conch. 16:87, textfig.3 (Port Alfred, Sth.Africa).
1921. *Bullia pura* var. *balteata* Sowerby, Proc.Malac.Soc.Lond. 14:127 (Port Alfred, Sth.Africa).
1932. *? Bullia gracilis* Turton, Mar.shells Pt.Alfred p.61, pl.14,fig.450 (Port Alfred, Sth.Africa).
1932. *Bullia kraussi* Turton, *ibid.* p.61, pl.14, fig.449 (Port Alfred, Sth.Africa).

Bullia (Bullia) rhodostoma Reeve, 1847

1847. *Bullia rhodostoma* Reeve, Conch.Icon. 3:pl.4,sp.25 (No locality; = Sth.Africa).

Bullia (Bullia) rogersi Smythe & Chatfield, 1981

1981. *Bullia rogersi* Smythe & Chatfield, J.Conch. 30:376, figs.g-i (Beach between Ra's Qudufah and Ra's al Jazirah, Gulf of Oman).

Bullia (Bullia) sendersi Kilburn, 1978

1978. *Bullia sendersi* Ann.Natal Mus. 23(2):297, pl.1, figs.a,b (Malindi, Kenya, 3°14'S & 4°08'E, E.Africa).

Bullia (Bullia) similis Sowerby, 1897

1897. *Bullia similis* Sowerby, Appendix Mar.shells Sth.Africa p.5, pl.7,fig.1 (Sth.Africa).

Bullia (Bullia) tenuis Reeve, 1846

1846. *Bullia tenuis* Reeve, Conch.Icon. 3:pl.1,sp.1 (No locality; = Sth.Africa).
1915. *Bullia lara* Bartsch, Bull.U.S.Nat.Mus. 91:53, pl.38,fig.3 (Port Alfred, Sth.Africa).

Barnard (1959) credited the authorship of this species first to Wood and also to Gray. *Buccinum tenue* Wood, 1828 (non Schroeter, 1805) which was later listed as *Cassis tenuis* Wood, is the species *Cassis (Cypraeacassis) tenuis* (Wood) from the west coast of America and *Buccinum tenue* Gray, 1839, is a *Volutopsius* Moerch, 1857 from Subarctic Seas. Barnard (1959) also described the egg-capsules of this species.

Dorsanum (Fluviodorsum) terebraeforme Dautzenberg, 1913

1913. *Dorsanum terebraeforme* Dautzenberg, Ann.L'Inst.Oceanog.Monaco 5:33, pl.1,figs.39,40 (Mossamedes Bay, West Africa, 15-20 m).

Bullia (Bullia) townsendi Melvill, 1912

1912. *Bullia (Leiodomus) townsendi* Melvill, Proc.Malac.Soc.Lond. 10:249, pl.11,figs.8,8a (Mekran coast, Gulf of Oman and Charbar).

Bullia (Bullia) tranquebarica (Roeding, 1798)

1798. *Plotia tranquebarica* Roeding, Mus.Bolten. p.96 (ref. Chemnitz, Syst. Conchyl.-Cab. 4:pl.155, fig.1463) [No locality; = Indian Ocean.]
1825. *Terebra lineolata* Sowerby, Cat.shells coll.Tankerville App. p.23 (ref.Chemnitz, *ibid.* 4:pl.155,fig.1463) [Tranquebar, India.]
1834. *Buccinum bellangeri* Kiener, Spec.gen.icon.coq.viv. 9:34,pl.14,fig.48 (Bengal Seas and coasts of Ceylon).

Bullia (Bullia) trifasciata E.A.Smith, 1904

1904. *Bullia trifasciata* E.A.Smith, J.Malac. 11:34, pl.2,fig.17 (Port Alfred, Sth.Africa).
1932. *? Bullia sowerbyi* Turton, Mar.shells Pt.Alfred p.60, pl.14,fig.444 (Port Alfred, Sth.Africa).

Bullia (Bullia) turrita Gray, 1839

1839. *Bullia turrita* Gray, Zool.Capt. Beechey's Voy. p.126 (No locality; = ?).
1859. *Terebra buccinulum* Deshayes, Proc.Zool.Soc.Lond. p.282 (East coast of Australia = error).

The species remains unlocalised. Reeve's (1846-47) illlustration of this species appears to be *Dorsanum granulosum* (Lamarck) from West Africa.

Buccinanops uruguayense (Pilsbry, 1897)

1897. *Bullia uruguayensis* Pilsbry, Nautilus 11:6 (Maldonado Bay, Uruguay).

? Bullia valida Dunker, 1852

1852. *Bullia valida* Dunker, Zeit.f.Malakozool. 9:191 (? Pacific Ocean = error).

The species remains unlocalised.

Bullia (Bullia) vittata (Linnaeus, 1767)

1767. *Buccinum vittatum* Linnaeus, Syst.Nat. ed.12:1206 (No locality; = Indian Ocean).
1811. *Ancilla alba* Perry, Conchology pl.31, fig.1. (No locality).
1817. *Eburna monilis* Schumacher, Essai nouv.syst. p.206 (ref.Chemnitz, Syst. Conchyl.-Cab. 4:305, pl.155, figs. 1461,1462 (No locality).
1824. *Terebra buccinoidea* Blainville, Dict.Sci.Nat. 32:206 (No locality).
1846. *? Bullia livida* Reeve, Conch.Icon. 3:pl.2,sp.10 (Zanzibar, E.Africa).
1848. *Bullia plicata* Redfield, Ann.Lyc.Nat.Hist.New York 4:491,pl.17,fig.1 (No locality).

DUBIOUS SPECIES AND SPECIES EXCLUDED FROM THE DORSANINAE

Bullia ampullacea v. Middendorf, 1848

1848. *Bullia ampullacea* v. Middendorf, Bull.Phys.Math.Act.Imp.St.Petersburg, 7:245 (non *Buccinum ampullaceum* Deshayes, 1844 = *Bullia*).

This species belongs to the genus *Volutharpa* Fischer, 1856, family Buccinidae, and lives in the Northern Pacific.

Bullia (Adinus) bantamensis Oostingh, 1933

1933. *Bullia (Adinus) bantamensis* Oostingh, De Mijningenieur 14(11):194, figs.4-6 (Tjikiroe, Sth.Bantam, Pliocene of Indonesia).

This is a species of *Adinus* H. & A.Adams, familial position uncertain.

Bullia (Adinus ?) chitanii Yokoyama, 1926

1926. *Bullia (Adinus ?) chitanii* Yokoyama, J.Fac.Sci.Imp.Univ.Tokyo 1(9):338, pl.41,fig.17 (Asuka, Totomi, Satsuka beds, Pliocene of Japan).

This is a very questionable *Bullia* and certainly not a member of *Adinus* H. & A.Adams.

Bullia cinerea Preston, 1906

1906. *Bullia cinerea* Preston, Proc.Malac.Soc.Lond. 7:34, textfig. (Ceylon ?).

This is a juvenile individual of *Nassarius dorsatus* (Roeding, 1798) from Australia.

Bullia (Adinus ?) crosseana Tapparone-Canefri, 1882

1882. *Bullia (Adinus ?) crosseana* Tapparone-Canefri, J.Conchyl. 30:23, pl.2,figs.1,2 (No locality).

The species appears to be closely similar to *Adinus truncatus* (Reeve), familial position uncertain.

Bullia elegans Dunker, 1857

1857. *Bullia elegans* Dunker, Proc.Zool.Soc.Lond. Pt.24:355 (No locality).

The author compared his new species to *Bullia natalensis* (Krauss, 1848). The type specimen is not in the Zoological Museum, Humboldt University, Berlin (Dr. R.Kilias *in litt.*).

Bullia fuscus Gray in Dieffenbach, 1843

1843. *Bullia fuscus* Gray in Dieffenbach, Travels in New Zealand, p.235 (ref. Martyn, 3:pl.121, fig.3 on left (No locality).

This is a species of *Hastula*, family Terebridae.

Bullia insignis Turton, 1932

1932. *Bullia insignis* Turton, Mar.shells Pt.Alfred p.65,pl.15,fig.471 (Port Alfred, Sth.Africa).

The species is unidentifiable.

Dorsanum (Adinus) javanum K.Martin, 1931

1931. *Dorsanum (Adinus) javanum* K.Martin, Weten.Meded.Mijnb.Weltev. 18:27, pl.4, fig.8 (Nanggoelan beds, Java, U.Eocene of Indonesia).

This is a questionable species of *Adinus* H. & A.Adams, familial position uncertain.

Bullia jucunda Turton, 1932

1932. *Bullia jucunda* Turton, Mar.shells Pt.Alfred p.67, pl.16,fig.484 (Port Alfred, Sth.Africa).

The species is unidentifiable.

Bullia (Adinus) litoralis Oostingh, 1933

1933. *Bullia (Adinus) litoralis* Oostingh, De Mijningenieur 14(11):195, fig.7 (Tjirantjabeureum, Sth.Bantam, Pliocene of Indonesia).

This is a species of *Adinus* H. & A.Adams, familial position uncertain.

Bullia martinii Gray in Dieffenbach, 1843

1843. *Bullia martinii* Gray in Dieffenbach, Travels in New Zealand p.234 (ref.Martyn,3:pl.121,fig.2) [No locality].

This species belongs to the family Terebridae.

Buccinum osseum Menke, 1829

1829. *Buccinum osseum* Menke, Conchyl.Samml.Malsburg p.29 (No locality).

This is an indeterminate species of *Bullia*.

Bullia perryi Jay, 1855

1855. *Bullia perryi* Jay, Perry's U.S.Jap.Exped. 2:295,pl.5,figs.13-15 (Japan).

This species belongs to the genus *Volutharpa* Fischer, 1856, family Buccinidae.

Bullia pulchella Turton, 1932

1932. *Bullia pulchella* Turton, Mar.shells Pt.Alfred p.64,pl.15,fig.463 (Port Alfred, Sth.Africa).

This is an indetermined species of *Bullia*.

Bullia (Adinus) provecta Beets, 1942

1942. *Bullia (Adinus) provecta* Beets, Leidsche geol.Mededeel. 13:281, pl.28,figs.64,65 (Kabungka, Buton I, U.Oligocene of Indonesia).

This is a questionable species of *Adinus* H. & A.Adams, familial position uncertain.

Bullia scalaris Turton, 1932

1932. *Bullia scalaris* Turton, Mar.shells Pt.Alfred p.65,pl.15,fig.469 (Port Alfred, Sth.Africa).

An indetermined species of *Bullia*.

Bullia (Adinus) sundaica Oostingh, 1939

1939. *Bullia (Adinus) sundaica* Oostingh, Ing.Ned.-Indie Mijnb. & Geol. 6(12):164, pl.15,figs.252-254 (Tjikiroeh, Sth.Bantam, Pliocene of Indonesia).

A species of *Adinus* H. & A.Adams, familial position uncertain.

Bullia tamsiana Dunker, 1853

1853. *Bullia tamsiana* Dunker, Ind.Moll.Guineam Inf.coll. G.Tams p.19 (Luanda, W.Africa).

This is an unidentifiable species of *Dorsanum* from West Africa. The type specimen has not been found in the Zoological Museum, Humboldt University, Berlin (Dr.R.Kilias *in litt.*)

Bullia thetis Turton, 1932

1932. *Bullia thetis* Turton, Mar.shells Pt.Alfred p.63, pl.15,fig.462 (Port Alfred, Sth.Africa).

An indetermined species of *Bullia*.

Terebra (?) tjidamarensis K.Martin, 1880

1880. *Terebra (?) tjidamarensis* K.Martin, Tertiaersch. Java p.32, pl.14, figs.4,4a (Tjidamar, Mio/Pliocene of Java, Indonesia).

This is probably a species of *Adinus* H. & A.Adams, familial position uncertain.

Bullia truncata Reeve, 1846

1846. *Bullia truncata* Reeve, Conch.Icon. 3:pl.3,sp.15 (No locality).

This species is the type-species of *Adinus* H. & A.Adams, familial position uncertain. The worn type-specimen from the British Museum (Nat.Hist.) is here illustrated (Fig. 101).

The taxa *Bullia lymnaeana* "A.Adams", H. & A.Adams, 1853, *Pseudostrombus malabaricus* "Hanley" H. & A.Adams, 1853, and *P. (Adinus) ictericus* "Solander", H. & A.Adams, are *nomina nuda*.

Subfamily **NASSARIINAE** Iredale, 1916

1916. Nassariinae Iredale, Proc.Malac.Soc.Lond. 12:82 (*ex*-Nassariidae).

Shells of this subfamily are less inflated and considerably more solid in structure than the Dorsaninae. Nassariinae differ from the Cylleninae in the absence of the sutural groove.

The animal in Nassariinae usually always has visual organs (except *N.dilutus* E.A.Smith), and the posterior of the foot has a pair of metapodial tentacles although a few species have only a single tentacle or none at all. The operculum is usually larger than in the Dorsanine genus *Bullia*.

GEOGRAPHICAL DISTRIBUTION. Cosmopolitan. Indo-Pacific; Mediterranean; Atlantic, Caribbean, North Sea, Eastern Pacific; Austral-Neozelanic region.

STRATIGRAPHICAL RANGE. Miocene to Recent.

Apart from a few coral reef and rock-dwellers, most species live in muddy, coralline or algal sand. The subfamily contains the 4 genera *Nassarius, Hebra, Demoulea* and *Cyclope* and 26 Recent and fossil subgenera exclusive of nominate subgenera. About 80% of all known Nassariidae belong to the subfamily Nassariinae.

CHECK-LIST OF GENERIC GROUPS OF NASSARIINAE BASED ON SPECIES FROM THE PACIFIC AND ATLANTIC COASTS OF AMERICA

Subgenus *Ilyanassa* Stimpson, 1865

Ilyanassa Stimpson, 1865, Americ.J.Conch. 1:61. Type species by OD *Nassa obsoleta* Say, 1822. Recent, Atlantic coast of America.

1867. *Paranassa* Conrad, 1868, Americ.J.Conch. 3.(4):262. Type species by SD (Cossmann, 1901) *Buccinum aratum* Say, 1824. Miocene of Virginia.

Subgenus *Caesia* H. & A.Adams, 1853

Caesia H. & A.Adams, 1853, Gen.Rec.Moll. 1:117. Type species by SD (Wenz, 1943) *Hinia (Caesia) perpinguis* (Hinds) = *Nassa perpinguis* Hinds, 1844. Recent, Pacific coast of America.

1853. *Zaphon* H. & A.Adams, Gen.Rec.Moll. 1:120. Type species by M *Nassa (Zaphon) elegans* (Reeve) = *Buccinum fossatum* Gould, 1850. Recent, Pacific coast of America.

1856. *Schizopyga* Conrad, Pacific railr. Repts. 6(2):60. Type species by M *S.californiana* Conrad, 1856. Pliocene of California. (non Gravenhorst, 1829).

1956. *Demondia* Addicott, U.S. Geol.Surv.Prof.Pap. 503-B:B3. Type species (art. 67(i) of ICZN) *Schizopyga californiana* Conrad, 1856 (nom. subst.pro *Schizopyga* Conrad, 1856).

Subgenus *Phrontis* H. & A.Adams, 1853

Phrontis H. & A.Adams, Gen.Rec.Moll. 1:117. Type species by SD (Cossmann, 1901) *Nassa tiarula* Kiener = *Buccinum tiarula* Kiener, 1841. Recent, Pacific coast of America.

Subgenus *Pallacera* Woodring, 1964

Pallacera Woodring, 1964, U.S.Geol.Surv.Prof.Pap. 306-C:269. Type species by OD *Nassa myristicata* Hinds, 1844. Recent, Pacific coast of America.

Subgenus *Nanarius* Woodring, 1964

Nanarius Woodring, 1964, U.S.Geol.Surv.Prof.Pap. 306-C:271. Type species by OD *Uzita paraprista* Gardner, 1944. Miocene of Florida and Panama.

Subgenus *Psilarius* Woodring, 1964

Psilarius Woodring, 1964, Nautilus 77(4):143. Type species (art. 67(i) of ICZN) *Leptarius leptus* Woodring, 1964. Miocene of the Panama Canal Zone (nom.subst.pro *Leptarius* Woodring, 1964).

1964. *Leptarius* Woodring, U.S.Geol.Surv.Prof.Pap. 306-C:271. Type species by OD *L.leptus* Woodring, 1964 (non *Leptarius* Gill, 1864).

Subgenus *Catillon* Addicott, 1965

Catillon Addicott, 1965, U.S.Geol.Surv.Prof.Pap. 503-B:B11. Type species by OD *Nassa arnoldi* Anderson, 1905. Miocene of West America.

The type species of *Catillon* is rather similar to species of *Uzita* (type-species *miga* Bruguière).

SYNONYMIC CHECK-LIST OF RECENT SPECIES OF NASSARIINAE FROM THE PACIFIC COAST OF AMERICA

Species of this faunal region have been monographed by Demond (1951, 1952), Keen (1971) and Kaicher (1982).

Nassarius angulicostis (Pilsbry & Lowe, 1932)

1932. *Nassa angulicostis* Pilsbry & Lowe, Proc.Acad.Nat.Sci.Philadelphia 84:69, pl.6,fig.2 (Guaymas; Santa Rosalia; San Juan del Sur, Nicaragua, 37 m).

This species is closely similar to the Galapagos Island *N.nodicinctus* (A.Adams 1852).

N.anguliferus (A.Adams, 1852)

1852. *Nassa angulifera* A.Adams, Proc.Zool.Soc.Lond. p.109 (Galapagos Is, 18 m).

N.bailyi (Pilsbry & Lowe, 1932)

1932. *Nassa bailyi* Pilsbry & Lowe, Nautilus 46:51; 1933 Pilsbry & Lowe, Nautilus 47:pl.8, fig.4 (Champerico, Guatemala).

The species is very similar to *N.luteostomus* (Broderip & Sowerby, 1829).

N.brunneostomus (Stearns, 1893)

1893. *Nassa brunneostoma* Stearns, Nautilus 7:10; 1893 Stearns, Proc.U.S.Nat.Mus. 16:344 (Gulf of California).

1929. *Nassa (Phrontis) cinisculus* var. *beltrani* Mari, Bull.Inst.Cat.Hist.Nat., (2), 8:134, pl.6,fig.1 (Santa Catalina I).

1932. *Nassa leucops* Pilsbry & Lowe, Nautilus 46:51; (1933 Pilsbry & Lowe), 47:18, fig.4 (Estuary back of Kino Bay, Sonora, Mexico).

This species is the *"Nassarius moestus"* of authors, but not of Hinds, 1844. For a detailed discussion see Cernohorsky (1975a).

N.catallus (Dall, 1908)

1880. *Nassa hanleyana* Marrat, Var.shells genus *Nassa* pp.75,83 (No locality) [non Dunker, 1847].

1908. *Alectrion (Hima) catallus* Dall, Bull.Mus.Comp.Zool.Harvard 43(6):215,307, pl.11,fig.11 (Gulf of Panama, 333 m).

1917. *Alectrion polistes* Dall, Proc.U.S.Nat.Mus. 51:577 (Panama Bay to Sechura Bay, Peru).

N.cerritensis (Arnold, 1903)

1903. *Nassa cerritensis* Arnold, Mem.Calif.Acad.Sci. 3:231, pl.4,fig.1 (Late Pleistocene of the west coast of U.S.A.).

This species occurs living from Baja, California to Guaymas, Mexico.

N.complanatus (Powys, 1835)

1835. *Nassa complanata* Powys, Proc.Zool.Soc.Lond. Pt.3:96 (west coast of America).

1849. *? Buccinum gemma* Philippi, Abb.Beschr.Conchyl. 3:44, pl.1,fig.5.

N.coppingeri (E.A.Smith, 1881)

1881. *Nassa (Tritia) coppingeri* E.A.Smith, Proc.Zool.Soc.Lond. p.30,pl.4,fig.7 (Tom Bay, Patagonia, 2-55 m).

1908. *Alectrion (Hima) miser* Dall, Bull.Mus.Comp.Zool.Harvard 43(6):215,307, pl.4,fig.1 (Gulf of Panama).

1940. *Nassa miser* var. *iniqua* Stewart in Woodring, Stewart & Richards, U.S.Geol.Surv.Prof.Pap. 195:87,pl.34,fig.8 (Kettleman Hills, Etchegon formation, Pliocene of California).

The distribution of this species is from Baja, California to Chile.

N.corpulentus (C.B.Adams, 1852)

1852. *Nassa corpulenta* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:284 (Panama and Taboga I).

1853. *Nassa polygonata* Reeve, Conch.Icon. 8:pl.18,fig.123 (Isle of Camiguing, Philippines = error) [non *Buccinum polygonatum* Lamarck, 1822].

1880. *Nassa rufolineata* Marrat, Var.shells genus *Nassa*, p.31 (nom.subst. pro *Nassa polygonata* Reeve, 1853).

N.delosi (Woodring in Woodring, Bramlette & Kew, 1946)

1903. *Nassa californiana* Arnold, Mem.Calif.Acad.Sci. 3:pl.4,fig.3 (non *Schizopyga californiana* Conrad, 1856).

1946. *"Nassa" delosi* Woodring in Woodring, Bramlette & Kew, U.S.Geol.Surv. Prof.Pap. 207:74, pl.35, figs.12-15 (Palos Verdes sand, Pleistocene of California) [nom.subst. pro *Nassa californiana* Arnold, 1903].

This species has been reported living from Mission Bay, San Diego, Newport Beach and other localities.

N.dentifer (Powys, 1835)

1835. *Nassa dentifera* Powys, Proc.Zool.Soc.Lond. p.95 (Bay of Arica, South America = Peru).

1852. *Nassa tschudii* Troschel, Arch.f.Naturg. 18:173,pl.5,figs.4a-c (Peru).

1858. *Buccinum unidentatum* Kuester, Syst.Conchyl.Cab.Martini & Chem. 3(1A):24, pl.5 (error for pl.6), figs.4-6 (coasts of Chile).

N.exilis (Powys, 1835)

1835. *Nassa exilis* Powys, Proc.Zool.Soc.Lond. p.95 (Payta, Peru).

1841. *Nassa fontainei* d'Orbigny, Voy.l'Americ.merid. p.433, pl.77,figs.5,6 (Payta, Peru).

1852. *Nassa panamensis* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:288 (Panama) [non *Buccinum panamense* Philippi, 1851 = *Nassarius* from Peru and Panama].

N.exsarcus (Dall, 1908)

1908. *Alectrion (Tritia) exsarcus* Dall, Bull.Mus.Comp.Zool.Harvard 43(6):215,308, pl.11,fig.12 (Near Galapagos Is, 549 m).

N.fossatus (Gould, 1850)

1842. *Buccinum elegans* Reeve, Conch.Systematica 2:234, pl.268, fig.3 (No locality) [non Costa, 1822; nec Sowerby, 1824, etc.].

1850. *Buccinum fossatum* Gould, Proc.Boston Soc.Nat.Hist. 3:152; 1852 Gould, U.S.Expl.Exped. 12:254, pl.19, figs.321a, (Puget Sound and mouth of Columbia river, Washington).

1852. *Nassa reevei* A.Adams, Proc.Zool.Soc.Lond. for 1851:109 (nom.subst. pro *Buccinum elegans* Reeve, 1842).

1867. *Nassa morleti* Crosse, J.Conchyl. 15:445; 1868 Crosse, J.Conchyl. 16:169, pl.6,fig.3 (No locality).

This species is the type-species of *Zaphon* H. & A.Adams, 1853.

N.gallegosi Strong & Hertlein, 1937

1937. *Nassarius gallegosi* Strong & Hertlein, Proc.Calif.Acad.Sci. (4), 22(6):166, pl.35,fig.11 (near Manzanillo, Colima, Mexico, 95 m).

The species is closely similar to *N.catallus* (Dall, 1908).

N.gayii (Kiener, 1834)

1834. *Buccinum gayii* Kiener, Spéc.gen.icon.coq.viv. 9:71, pl.21,fig.79 (coast of Chile).

1845. *? Buccinum taeniolatum* Philippi, Arch.f.Naturg. 11:69 (Chonos I, Patagonia).

1850. *Nassa rubricata* Gould, Proc.Boston Soc.Nat.Hist. 3:155; 1852 Gould, U.S.Expl.Exped. 12:265, pl.19,figs.332a, (Pacific shore).

1906. *Nassa nevilliana* Preston, Proc.Malac.Soc.Lond. 7:34, textfig. (? Ceylon = error).

1909. *Nassa flammulata* Preston, Ann.Mag.Nat.Hist. (8), 3:512,pl.10,fig.13 (S.Peru).

N.gemmulosus (C.B.Adams, 1852)

1852. *Nassa gemmulosa* C.B.Adams, Ann.Lyc.Nat.Hist. New York 5:285 (Panama).

1880. *Nassa decorata* Marrat, var.shells genus *Nassa* p.81 (No locality).

1941. *Nassa cara* Pilsbry & Olsson, Proc.Acad.Nat.Sci.Philadelphia 93:30 (Punta Blanca, Canoa formation, Pliocene of W.Ecuador).

N.goniopleura (Dall, 1908)

1908. *Alectrion (Tritia ?) goniopleura* Dall, Bull.Mus.Comp.Zool.Harvard 43(6):215,308 (near Galapagos Is, 1194 m).

This species was based on a worn, damaged and juvenile specimen.

N.guaymasensis (Pilsbry & Lowe, 1932)

1932. *Nassa guaymasensis* Pilsbry & Lowe, Proc.Acad.Nat.Sci.Philadelphia 84:69, pl.6,fig.3 (off Guaymas, Mexico, 37 m).

N.howardae Chace, 1958

1958. *Nassarius howardae* Chace, Trans.S.Diego Soc.Nat.Hist. 12:333, fig.1 (San Felipe, Baja, California, Mexico).

N.insculptus (Carpenter, 1864)

1864. *Nassa insculpta* Carpenter, Brit.Assoc.Adv.Sci.Rept. for 1863:662 (Catalina I, 73 m).

1917. *Alectrion insculptus* var. *eupleura* Dall, Proc.U.S.Nat.Mus. 51:576 (San Simeon, California to Cerros I).

1951. *Nassarius insculptus gordanus* Hertlein & Strong, Zoologica New York 36(2):81, pl.8,fig.6 (Gorda Banks, Gulf of California, 110 m).

N.iodes (Dall, 1917)

1917. *Arcularia iodes* Dall, Proc.U.S.Nat.Mus. 51:577 (Gulf of California).

A small species which is closely similar to *N.complanatus* (Powys).

N.limacinus (Dall, 1917)

1917. *Alectrion limacina* Dall, Proc.U.S.Nat.Mus. 51:577 (Gulf of California).

N.luteostomus (Broderip & Sowerby, 1829)

1829. *Nassa luteostoma* Broderip & Sowerby, Zool. J. 4:376 (W.coast of America).
1839. *Nassa xanthostoma* Gray, Zool.Capt. Beechey's voy. p.127, pl.36,fig.3 (No locality).
1857. *Nassa ? tegula* var. *nodulifera* Carpenter, Cat.Mazatlan shells Brit.Mus. p.496 (Mazatlan) [non Buccinum noduliferum Philippi, 1849 = *Nassarius*].

N.mendicus (Gould, 1850)

1850. *Nassa mendica* Gould, Proc.Boston Soc.Nat.Hist. 3:155 (Puget Sound, W.coast of America).
1852. *Nassa cooperi* Forbes, Proc.Zool.Soc.Lond. for 1850:273, pl.11,fig.4 (marked "Sandwich I" = error).
1852. *Nassa woodwardi* Forbes, *ibid.* p.273, pl.11, fig.3 (marked "Sandwich I" = error).
1859. *Nassa gibsii* Cooper, U.S.Pacific Railr.Repts.Suppl. 1(3):371.
1877. *Nassa acutangula* Marrat, Prop.new forms *Nassa* p.9 (No locality).
1927. *Alectrion mendicus indisputabilis* Oldroyd, Stanford Univ.Publ.Geol.Sci. 2(1):pl.26,fig.4.

N.myristicatus (Hinds, 1844).

1844. *Nassa myristicata* Hinds, Zool.voy. "Sulphur" p.36, pl.9,figs.10,11 (Cape of Good Hope = error).

This species is the type-species of *Pallacera* Woodring, 1964.

N.nodicinctus (A.Adams, 1852)

1852. *Nassa nodicincta* A.Adams, Proc.Zool.Soc.Lond. p.110 (Galapagos I, 13 m).

N.nucleolus (Philippi, 1846)

1846. *Buccinum nucleolus* Philippi, Zeit.f.Malakozool. 3:52 (Mazatlan).

Some authors have confused *Nassarius taeniolatus* (Philippi, 1845) with *N.nucleolus*. The latter species ranges from Mexico to Mazatlan, and it is a minute species not exceeding 7.0 mm in length (original dimensions 3" x 2" = 6.5 x 4.4 mm). *N.taeniolatus* was described from Chonos I, Patagonia, and according to E.A.Smith (1881) the dimensions of Philippi's specimen was length 16.5 mm. *N.taeniolatus* (Philippi) is most probably a synonym of *N.gayii* (Kiener).

N.onchodes (Dall, 1917)

1917. *Alectrion onchodes* Dall, Proc.U.S.Nat.Mus. 51:577 (off Cerros I, Lower California to Panama).

N.pagodus (Reeve, 1844)

1841. *Buccinum decussatum* Kiener, Spéc.gen.icon.coq.viv. 9:109,pl.30,fig.3 (Probably West Africa = error) [non Linnaeus, 1758].
1844. *Triton pagodus* Reeve, Conch.Icon. 2:pl.20,sp.97 (Bay of Montija, W.Colombia).
1852. *Nassa canescens* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:283 (Panama).
1857. *Nassa pagoda* var. *acuta* Carpenter, Cat.coll.shells Mazatlan p.497 (Mazatlan) [non Say, 1822].

N.perpinguis (Hinds, 1844)

1844. *Nassa perpinguis* Hinds, Zool. Voy. "Sulphur" p.36, pl.9,figs.12,13 (west coast of America).
1852. *Nassa corrugata* A.Adams, Proc.Zool.Soc.Lond. p.110 (Eastern Seas = error) [non *Buccinum corrugatum* Brocchi, 1814 = *Nassarius*].
1855. *Nassa intastriata* Conrad, U.S.House Repres.House Document No.129:17 (corrected to *interstriata* in 1856).
1877. *Nassa undata* Marrat, Prop.new forms gen. *Nassa* p.9 (No locality).
1908. *Nassa perpinguis* var. *bifasciata* Berry, Nautilus 22:39 (San Pedro, California).
1918. *Alectryon (Hima) gwatkinianus* Melvill, Ann.Mag.Nat.Hist. (9), 1:139, pl.4,fig.4 (Persian Gulf = error).

This species is the type-species of *Caesia* H. & A.Adams, 1853.

N.rhinetes Berry, 1953

1953. *Nassarius (Schizopyga) rhinetes* Berry, Trans.S.Diego Soc.Nat.Hist. 11(16):415, pl.28,fig.7 (off Moss Landing, Monterey Bay, California, 73 m).

This appears to be the *N.californianus* of authors (non Conrad, 1856), and may be the living representative of *N.delosi* Woodring, 1946.

N.scabriusculus (Powys, 1835)

1835. *Nassa scabriuscula* Powys, Proc.Zool.Soc.Lond. p.95 (Bay of Montija, Sth.America).
1852. *Nassa collaria* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:283 (Panama).

N.shaskyi McLean, 1970

1970. *Nassarius shaskyi* McLean, Malac.Review 2:128, textfig.41 (off Gorgona I, Colombia, 3°01'25"N & 78°10'W, 37 m).

The species is very similar to *N.corpulentus* (C.B.Adams, 1852).

N.stimpsonianus (C.B.Adams, 1852)

1852. *Buccinum stimpsonianum* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:296 (Panama).
1852. *Nassa fuscata* A.Adams, Proc.Zool.Soc.Lond. p.112 (No locality).
1880. *Nassa lauta* Marrat, Var.shells genus *Nassa* pp.67,82 (Malacca = error).

N.striatus (C.B.Adams, 1852)

1852. *Nassa striata* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:289 (Taboga, Panama).

Kaicher (1982) reports the species to be ovoviviparous. The species has been synonymised with *N.versicolor* (C.B.Adams, 1852), but Kaicher *(op.cit.)* suggests that this species is "probably" not ovoviviparous. Until the mode of oviposition of *N.versicolor* is known, *N.striatus* is tentatively accepted as a valid species.

N.tiarula (Kiener, 1841)

1841. *Buccinum tiarula* Kiener, Spéc.gen.icon.coq.viv. 9:111, pl.30,fig.4 (Indian Ocean & Madagascar = error).

1853. *Nassa tegula* Reeve, Conch.Icon. 8:pl.15,fig.98 (No locality).

1894. *Nassa complanata* var. *major* Stearns, Proc.U.S.Nat.Mus. 17:181 (Los Animas Bay, L.California, 28°50'N & 113°20'W) [non Jeffreys, 1867].

This species is the type-species of *Phrontis* H. & A.Adams, 1853.

N.townsendi (Dall, 1890)

1890. *Nassa townsendi* Dall, Proc.U.S.Nat.Mus. 12 (773):326, pl.12,fig.9 (near Galapagos Is, 1,486 m).

N.versicolor (C.B.Adams, 1852)

1852. *Nassa versicolor* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:290 (Taboga, Panama).

1852. *Nassa glauca* C.B.Adams, *ibid.* 5:285 (Panama) [non *Buccinum glaucum* Dunker, 1852].

1852. *Nassa proxima* C.B.Adams, *ibid.* 5:288 (Taboga, Panama) [non Sowerby in Smith, 1847].

1852. *Nassa rufocincta* A.Adams, Proc.Zool.Soc.Lond. p.106 (Honduras).

1852. *Nassa versicolor* var. *striatula* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:290 (Panama).

1853. *Nassa albipunctata* Reeve, Conch.Icon. 8:pl.21,sp.144 (No locality).

1854. *Nassa nucleolus* Reeve, Conch.Icon. 8:pl.27, figs.178a,b (No locality) [non *Buccinum nucleolus* Philippi, 1846 = *Nassarius*].

1857. *Nassa crebristriata* Carpenter, Cat.coll.shells Mazatlan p.499 (Mazatlan).

1867. *Nassa lecadrei* de Folin, Les Méléagrinicoles, Le Havre, p.73,pl.6,fig.14 (Isles aux Perles = Perlas Is, Panama).

1880. *Nassa picturata* Marrat, Var.shells genus *Nassa* pp.57,58 (No locality).

1903. *Nassa versicolor* var. *hooveri* Arnold, Mem.Calif.Acad.Sci. 3:236, pl.4, fig.6.

N.wilsoni (C.B.Adams, 1852)

1852. *Nassa wilsoni* C.B.Adams, Ann.Lyc.Nat.Hist.New York 5:291 (Panama).

SPECIES OF NASSARIINAE INTRODUCED TO THE PACIFIC COAST OF AMERICA

Nassarius fraterculus (Dunker, 1860)

1860. *Nassa fraterculus* Dunker, Malakozool.Blaetter p.230; (1861 Dunker), Moll. Japonica p.7, pl.1,fig.15 (Decima, Japan).

The species was introduced from Japan and by 1960 was well established at Puget Sound, Washington (Abbott 1974).

N.(Ilyanassa) obsoletus (Say, 1822)

1822. *Nassa obsoleta* Say, J.Philadelphia Acad.Sci. (1), 2:232 (Nova Scotia - Florida).

This species was introduced from the Atlantic side of America to California, where it became established prior to 1911 (Abbott 1974).

CHECK-LIST OF MIO-PLIOCENE SPECIES OF NASSARIINAE FROM THE PACIFIC COAST OF AMERICA

Nassarius parapristus acolus Woodring, 1964

1964. *Nassarius (Nanarius) parapristus acolus* Woodring, U.S.Geol.Surv.Prof. Pap. 306-C:271, pl.40, figs.16,17 (Sth. of Gatun, M.Miocene of Panama).

1964. *Nassarius (Nanarius) parapristus conarus* Woodring, *ibid.*, 306-C:272, pl.43, figs. 3,8 (Payardi I, M.Miocene of Panama).

N.andersoni (Weaver, 1912)

1912. *Nassa andersoni* Weaver, Washington Geol.Surv.Bull. 15:75, pl.6,fig.56 (Grays Harbor Cty., Quinault formation, Mio-Pliocene of Washington).

N.antiselli (Anderson & Martin, 1914)

1914. *Nassa antiselli* Anderson & Martin, Proc.California Acad.Sci. (4), 4:76, pl.7,fig.16 (San Luis Obispo Cty., M.Miocene of California).

N.armuellus (Olsson, 1942)

1942. *Nassa (Uzita) armuella* Olsson, Bull.Americ.Paleont. 27(106):71, pl.8,fig.6 (Charco Azul, Pliocene of Panama) [as *armulla* in text].

N.arnoldi (Anderson, 1905)

1905. *Nassa arnoldi* Anderson, Proc.California Acad.Sci.Geol. (3), 2:204,pl.16, figs.70,71 (Kern River, M.Miocene of California).

N.californianus (Conrad, 1856)

1856. *Schizopyga californiana* Conrad, Proc.Acad.Nat.Sci.Philadelphia 8:315; 1857 Conrad, U.S.Cong.Senate Exec.Docum. 6(2):69, pl.2,fig.1 (19 km back from Santa Clara, Pliocene of California).

1907. *Nassa waldorfensis* Arnold, Smithsonian Misc.coll. 50(4):434, pl.54, fig.17 (Santa Maria district, Pliocene of California).

1910. *Nassa californiana* var. *coalingensis* Arnold, U.S.Geol.Surv.Bull. No.396:88, pl.27, fig.9 (San Joaquin valley, Pliocene of California).

This species is the type species of *Demondia* Addicott, 1965.

N.churchi (Hertlein, 1928)

1928. *Alectrion churchi* Hertlein, J.Paleontology 2:156, pl.22,fig.2 (Santa Rosa I, L.Miocene of California).

N.collinsi Perrilliat, 1972

1972. *Nassarius collinsi* Perrilliat, Paleont.Mexicana No.32:97, pl.46, figs.13-18 (Santa Rosa, Vera Cruz, M.Miocene of Mexico).

N.dalli (Olsson, 1964)

1964. *Hindsia dalli* Olsson, Neogene Moll. N.W.Ecuador p.205, pl.36,figs.5,5a (Telembi, Rio Cayapas, Mio-Pliocene of N.W.Ecuador) [non *Nassa dalli* Maury, 1910 = *Nassarius*].

Olsson's taxon is a secondary homonym of *Nassa dalli* Maury, 1910, from Miocene deposits of Florida.

N.ecuadorianus (Pilsbry & Olsson, 1941)

1941. *Nassa (Perunassa) ecuadoriana* Pilsbry & Olsson, Proc.Acad.Nat.Sci.Philadelphia 93:31, pl.4,figs.2,8,11 (Punta Blanca beds, Pliocene of W.Ecuador).

N.gardnerae Perrilliat, 1972

1972. *Nassarius (Uzita) gardnerae* Perrilliat, Paleont.Mexicana No.32:99, pl.47,figs.7,8 (Santa Rosa, Vera Cruz, M.Miocene of Mexico) [non *Alectrion gardnerae* Dall, 1915 = *Nassarius*].

This taxon is a secondary homonym of *Alectrion gardnerae* Dall, 1915, from Miocene deposits of Florida.

N.hamlini (Arnold, 1907)

1907. *Nassa hamlini* Arnold, Proc.U.S.Nat.Mus. 32:537, pl.50,fig.9 (Third Street tunnel, Los Angeles, L.Pliocene of California).

N.harrellensis Addicott, 1970

1970. *Nassarius (Phrontis) harrellensis* Addicott, U.S. Geol. Surv.Prof.Pap. 642:100, pl.12, figs.5,6 (Kern River area, M.Miocene of California).

N.hildegardae Kanakoff, 1956

1956 *Nassarius hildegardae* Kanakoff, Bull.S.California Acad.Sci. 55(2):113, pl.31 (Los Angeles Cty., Pico formation, L.Pliocene of California).

N.hoquiamensis Addicott, 1966

1966. *Nassarius hoquiamensis* Addicott, J.Paleontology 40:640, pl.78,figs. 4,5 (Mio-Pliocene of Washington).

N.hylus Olsson, 1964

1964. *Nassarius (Uzita) hylus* Olsson, Neogene Moll.N.W.Ecuador p.145, pl.37, figs.10,11 (Quebrada Camarones, Esmeralda formation, Neogene of Ecuador).

N.leptus (Woodring, 1964)

1964. *Leptarius leptus* Woodring, U.S.Geol.Surv.Prof.Pap. 306-C:272, pl.44, figs.1,5 (Quebrada Cana, M.Miocene of Panama).

This species is the type-species of *Psilarius* Woodring, 1964.

N.lincolnensis (Anderson & Martin, 1914)

1914. *Nassa lincolnensis* Anderson & Martin, Proc.California Acad.Sci. (4), 4:77, pl.7, figs.14a,b (Yaquina Head, N.of Newport, M.Miocene of Oregon).

N.mastus Olsson, 1964

1964. *Nassarius (Uzita) mastus* Olsson, Neogene Moll.N.W.Ecuador p.146, pl.38,fig.7 (Cueva de Angostura, Rio Santiago, Angostura formation, Neogene of N.W.Ecuador).

N.merenda (Olsson, 1922)

1922. *Alectrion merenda* Olsson, Bull.Americ.Paleontology 9(39):124, pl.9, fig.19 (Old Man Sam Creek, Uscari stage, L.Miocene of Costa Rica).

N.moranianus (Martin, 1914)

1914. *Nassa moraniana* Martin, Univ.California Publ.Geol. 8(7):183, pl.22, figs.1a-c (Bolinas Bay, Marin Cty., Merced series, L.Pliocene of California).

1917. *Alectrion grammatus* Dall, Proc.U.S.Nat.Mus. 51:575 (Santa Barbara, Pleistocene of California).

N.newcombei (Merriam, 1897)

1897. *Nassa newcombei* Merriam, Nautilus 11(6):65 (Vancouver I, Miocene of British Columbia).

N.ocoyanus (Anderson & Martin, 1914)

1914. *Nassa ocoyana* Anderson & Martin, Proc. California Acad.Sci. (4), 4:75, pl.7,fig.17 (Kern Cty., M.Miocene of California).

1914. *Nassa blakei* Anderson & Martin, *ibid.*, 4:76, pl.7, figs.15a,b (Kern Cty., M.Miocene of California).

N.oldroydae (Dall & Ochsner, 1928)
1928. *Alectrion oldroydae* Dall & Ochsner, Proc.California Acad.Sci. (4), 17(4):110, pl.2,fig.10 and pl.6,fig.8 (E.shore Indefatigable I, Pliocene of Galapagos Is).

N.pabloensis (Clark, 1915)
1915. *Nassa pabloensis* Clark, Univ.California Publ.Geol. 8:493, pl.65, figs.8,9 (Shell ridge, Walnut creek, Contra Costa Cty., Upper San Pablo group, U.Miocene of California).

N.pacis (Pilsbry & Olsson, 1941)
1941. *Nassa pacis* Pilsbry & Olsson, Proc.Acad.Nat.Sci.Philadelphia 93:31, pl.8, figs.6,8 (Punta Blanca, Canoa formation, Pliocene of W.Ecuador).

N.paltus (Pilsbry & Olsson, 1941)
1941. *Nassa palta* Pilsbry & Olsson, Proc.Acad.Nat.Sci.Philadelphia 93:30, pl.6,figs.4,5 (Punta Blanca beds, Pliocene W.Ecuador).

N.posoensis Addicott, 1970
1970. *Nassarius (Phrontis ?) posoensis* Addicott, U.S.Geol.Surv.Prof.Pap. 642:101, pl.12, figs.1,2 (Kern River area, M.Miocene of California).

N.praeambiguus (Brown & Pilsbry, 1913)
1913. *Nassa (Hima) praeambigua* Brown & Pilsbry, Proc.Acad.Nat.Sci.Philadelphia 64:506, pl.22,figs.6,7 (Tower N. of Culebra cut, L.Miocene of Panama).

N.puntablancanus (Pilsbry & Olsson, 1941)
1941. *Nassa puntablancana* Pilsbry & Olsson, Proc.Acad.Nat.Sci.Philadelphia 93:32, pl.5,figs.5,11 (Punta Blanca, Canoa formation, Pliocene W.Ecuador).

N.ranunculus (Olsson, 1922)
1922. *Alectrion ranuncula* Olsson, Bull.Americ.Paleont. 9(39):123, pl.9, figs.20,22 (Banana River, Gatun beds, L.Miocene of Costa Rica).
This species is very similar to *N.acutus* (Say).

N.repetiti Olsson, 1964
1964. *Nassarius repetiti* Olsson, Neogene Moll.N.W.Ecuador p.146, pl.24, figs.6,6a (Telembi, Angostura formation, Neogene of N.W. Ecuador).

N.salinasensis Addicott, 1965
1965. *Nassarius (Catilon ?) salinasensis* Addicott, U.S.Geol.Surv.Prof.Pap. 503-B:B15, pl.3,figs.30,31 (Pancho Rico Creek, Monterey Cty., L.Pliocene of California).

N.schacklefordensis (Olsson, 1916)
1916. *Nassa shacklefordensis* Olsson, Bull.Americ.Paleont. 5(27):14, pl.2, fig.4 (Shackleford, Vancouver, M.Miocene of Canada).

N.smooti Addicott, 1965
1965. *Nassarius (Catillon) smooti* Addicott, U.S.Geol.Surv.Prof.Pap. 503-B: B13, pl.3,figs.7-9 (Kern River area, Kern Cty., M.Miocene of California).

N.stocki Kanakoff, 1956
1956. *Nassarius stocki* Kanakoff, Bull.S.California Acad.Sci. 55(2):110, pl.30,figs.A-C (Los Angeles Cty., Pico formation, L.Pliocene of California).

N.tehuantepecensis Perrilliat, 1972
1972. *Nassarius (Uzita) tehuantepecensis* Perrilliat, Paleont.Mexicana No.32:99, pl.47, figs.5,6,9-12 (Santa Rosa, Vera Cruz, M.Miocene of Mexico).

N.terryi (Olsson, 1942)
1942. *Nassa (Uzita) terryi* Olsson, Bull.Americ.Paleont. 27(106):70, pl.8, fig.2 (Puerto Armueles, Pliocene of Panama).

N.thielei Olsson, 1964
1964. *Nassarius (Profundinassa) thielei* Olsson, Neogene Moll. N.W.Ecuador, p.145, pl.24,figs.7,7a (Punta Gorda, Esmeraldas formation, Neogene of Ecuador).

N.tinosus (Pilsbry & Olsson, 1941)
1941. *Nassa tinosa* Pilsbry & Olsson, Proc.Acad.Nat.Sci.Philadelphia 93:29, pl.6,figs.6,7 (Puerto Jama, Jama formation, Pliocene W.Ecuador).

N.tropicalis (Dall & Ochsner, 1928)
1928. *Alectrion tropicalis* Dall & Ochsner, Proc.California Acad.Sci. (4), 17(4):109, pl.2,fig.9 (Seymour I, Pliocene of the Galapagos Is).

N.villarelloi (Engerrand & Urbina, 1910)
1910. *Nassa (Uzita ?) villarelloi* Engerrand & Urbina, Bol.Soc.geol.Mexicana 6:128, pl.59, figs.42-48 (Zuluzum, Chiapas, M.Miocene of Mexico).

N.whitneyi (Trask, 1922)
1922. *Nassa whitneyi* Trask, Univ.California Publ.Geol. 13:154, pl.7,figs.3,6 (Contra Costa Cty., Sobrantes and Briones sandstone, Miocene of California).
The species is very similar to *N.arnoldi* (Anderson, 1905). Addicott (1978) considers them separable species.

DUBIOUS SPECIES AND SPECIES EXCLUDED FROM THE NASSARIINAE FROM THE PACIFIC COAST OF AMERICA

Nassa antiquata Gabb, 1864

1864. *Nassa antiquata* Gabb, Bull.Geol.Surv.California 1:97, pl.18, fig.50 (Martinez formation, Eocene of California).

The species probably belongs to *Colwellia* Nuttall & Cooper, 1973, a genus closely related to the photine Buccinidae.

Buccinum antoni Dunker, 1847

1847. *Buccinum antoni* Dunker, Zeit.f.Malakozool. 4:61 (Mexico).

The author compared his species with the Italian Pliocene *Nassarius prismaticus* (Brocchi, 1814). The type is lost and the species remains unidentified.

Nassa chehaliensis Weaver, 1916

1916. *Nassa chehaliensis* Weaver, Washington Univ.Publ.Geol. 1(1):46, pl.5, figs.69,70 (Astoria formation), M.Miocene of Washington).

This species is a synonym of *Antillophos posunculensis* (Anderson & Martin, 1914), family Buccinidae.

Nassa eocenica Weaver, 1912

1912. *Nassa eocenica* Weaver, Bull.Washington Geol.Surv. 15:42, pl.3,fig.32 (Cowlitz formation, U.Eocene of Washington).

The species belongs to the family Buccinidae.

Buccinum escalae Philippi, 1860

1860. *Buccinum escalae* Philippi, Atac.Reise p.188, pl.7, fig.19 (Mejillones, Chile).

The species is a *Nassarius (Hima)* according to Dall (1909). It has not been listed or mentioned in literature again and remains unidentified.

Nassa moesta Hinds, 1844

1844. *Nassa moesta* Hinds, Zool.Voy."Sulphur", Moll.Pt.2:36, pl.9, figs. 18, 19 (Gulf of Papagayo = error).

1975. *Nassarius moestus* (Hinds), Cernohorsky, Rec.Auckland Inst.Mus.12:139, figs.39-41.

The species has been erroneously reported from the Pacific coast of America. *Nassarius moestus* has an Indo-Pacific distribution and the West American species will bear the name *N.brunneostomus* (Stearns, 1893).

Nassa northiae Gray in Griffith & Pidgeon, 1834

1834. *Nassa northiae* Gray in Griffith & Pidgeon, Anim.Kingd.Baron Cuvier, Moll.Rad.12:598, pl.30, fig.2 (No locality).

This species is the type-species of *Northia* Gray, 1847, family Buccinidae, from the Pacific coast of America.

Buccinum panamense Philippi, 1851

1851. *Buccinum panamense* Philippi, Zeit.f.Malakozool. 8:61 (Payta, Peru).

The species was compared by the author with the European Pliocene *Nassarius prismaticus* (Brocchi, 1814). The type is lost and the species remains unidentified.

Buccinum paposanum Philippi, 1860

1860. *Buccinum paposanum* Philippi, Atac.Reise, p.188 (Paposo, Chile).

The species is a *Nassarius* according to Dall (1909), but the type is lost and the species is unidentifiable.

Nassa pedroana Conrad, 1855

1855. *Nassa pedroana* Conrad, U.S.House Repr.House Docum. No.129:17; 1856 Conrad, Pacific Rail Road Repts. 5:327, pl.6, fig.48 (San Pedro, Pleistocene of California).

This species is a synonym of the Recent *Nitidella gausapata* (Gould, 1850), family Columbellidae.

Nassa planocostata A.Adams, 1852

1852. *Nassa planocostata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108 (Payta, Peru = error).

The species has been erroneously reported from Peru, but it has been shown (Cernohorsky 1975a) that *Nassa planocostata* A.Adams, is of Indian Ocean origin and is a synonym of *Nassarius foveolatus* (Dunker, 1847).

Alectrion salina Olsson, 1928

1928. *Alectrion salina* Olsson, Bull.Americ.Paleont. 14(52):82, pl.18, fig.13 (Saman formation, U.Eocene of Peru).

This species is a member of the *Phos* group, family Buccinidae.

Alectrion terebratulus Olsson, 1928

1928. *Alectrion terebratulus* Olsson, Bull.Americ.Paleont. 14(52):83, pl.18, figs.14, 15 (Saman formation, U.Eocene of Peru).

This species belongs to the *Phos* group, family Buccinidae.

SYNONYMIC CHECK-LIST OF RECENT SPECIES OF NASSARIINAE FROM THE WEST ATLANTIC – CARIBBEAN FAUNAL PROVINCE

Species of this region have been monographed by Abbott (1974) and Kaicher (1982).

Nassarius acutus (Say, 1822)

1822. *Nassa acuta* Say, J.Acad.Nat.Sci.Philadelphia 2:234 (Florida-Texas).

"N.albus (Say, 1826)"

1799. *? Buccinum ambiguum* Pulteney, Cat.Birds Dorset p.42 (non Solander, 1766).
1826. *Nassa alba* Say, J.Acad.Nat.Sci.Philadelphia 5:212 (The southern coast of Florida and the West India Islands).
1843. *? Nassa candei* d'Orbigny in Sagra, Hist.phys.polit.nat.l'ile Cuba 2:142, pl.23, figs.4-6 (Cuba).
1852. *? Nassa clathratula* A.Adams, Proc.Zool.Soc.Lond. p.99 (Siquijor I, Philippines = error).
1852. *? Nassa obtusata* A.Adams, Proc.Zool.Soc.Lond. p.100 (Ticao I, Philippines, 13 m = error).
1853. *? Nassa annelifera* Reeve, Conch.Icon. 8:pl.25, fig.168 (No locality).
1877. *? Nassa pura* Marrat, Prop.new forms genus *Nassa* p.13 (West Indies).
1880. *? Nassa quinquecostata* Marrat, Var.shells genus *Nassa* pp.61,82 (No locality) [spelled *quinqueplicata* on p.89].

It appears that two different species have been confused under the name *"Nassarius albus* (Say, 1826)": a species with a protoconch of only 1½ whorls which is ovoviviparous (Kaicher 1972) and a species with a protoconch of 3¼-3½ whorls, which is apparently not ovoviviparous and which deposits egg-cases in capsules (Bandel 1976). The nomenclature of these 2 related species requires revision through re-examination of all types of the taxa concerned and subsequent re-assignment to the appropriate synonymy. Since Say's type-specimen of *albus* is lost we don't know if his was the species with a paucispiral or multispiral protoconch. A neotype designation would stabilise nomenclature of the species.

N.candidissimus (C.B.Adams, 1845)

1845. *Buccinum candidissimum* C.B.Adams, Proc.Boston Soc.Nat.Hist. 2:2 (Jamaica).

N.capillaris (Watson, 1882)

1882. *Nassa (Hima) capillaris* Watson, J.Linn.Soc.Lond. 16:369 (Fernando Noronha I, Brazil).

N.consensus (Ravenel, 1861)

1861. *Nassa consensa* Ravenel, Proc.Acad.Nat.Sci.Philadelphia 13:43 (Florida to Nth.Carolina).
1930. *Alectrion consensa harveyensis* Mansfield, Florida State Geol.Surv.Bull. No.3:78, pl.11, figs.1,3 (Harvey's creek, Leon Cty., U.Miocene of Florida).
1930. *Alectrion consensa leonensis* Mansfield, *ibid.*, No.3:79, pl.10, fig.2 (Harvey's creek, Leon Cty., U.Miocene of Florida).
1953. *Nassarius (Uzita) fargoi* Olsson & Harbison, Acad.Nat.Sci.Philad.Mon. No.8:223, pl.33, fig.3 (St. Petersburg, Pliocene of Florida).

N.hotessieri (d'Orbigny, 1843)

1843. *Nassa hotessieri* d'Orbigny in Sagra, Hist.phys.polit.nat.l'ile Cuba 2:142, pl.21, figs.40-43 (Cuba).

N.karinae Usticke, 1971

1959. *Nassarius nanus* Usticke, Check-list mar.shells St.Croix p.70, pl.4, fig. 5 (Cane Bay, St.Croix I, Virgin Is) [non *Nassa nana* A.Adams, 1852 = *Nassarius*].
1971. *Nassarius karinae* Usticke, Suppl.list new shells, rev.ed. No.806, pl.4, fig.806 (nom.subst.pro *N.nanus* Usticke, 1959).

N.nigrolabrus (Verrill, 1880)

1880. *Nassa (?) nigrolabra* Verrill, Proc.U.S.Nat.Mus. 3:371; 1880 Verrill, Trans.Connect. Ac. 5:512, pl.58, fig.12 (Southern New England, 284 m).

N.obsoletus (Say, 1822)

1822. *Nassa obsoleta* Say, J.Philadelphia Acad.Sci. (1), 2:232 (Nova Scotia to Florida).
1828. *Buccinum noveboracensis* Wood, Suppl.Index Test. p.13, pl.4, fig.26 (New York).
1834. *Buccinum oliviforme* Kiener, Spec.gen.icon.coq.viv. 9:70, pl.25, fig.99 (North America).

This species is the type-species of *Ilyanassa* Stimpson, 1865.

N.paucicostatus (Marrat, 1877)

1877. *Nassa paucicostata* Marrat, Prop.forms genus *Nassa* p.11 (Nassau, Caribbean).

N.scissuratus (Dall, 1889)

1889. *Nassa scissurata* Dall, Bull.Mus.Comp.Zool.Harvard 18:185; 1890 Dall, Proc.U.S.Nat.Mus. 12:326, pl.5, fig.2 (Barbados, Caribbean).
1889. *Nassa scissurata pernitida* Dall, *ibid.*, 18:186 (near Barbados, Caribbean).

N.simplex (E.A.Smith, 1880)

1880. *Nassa (Caesia) simplex* E.A.Smith, Ann.Mag.Nat.Hist. (5), 6:319 (off the mouth of the Rio de la Plata) [non S.V.Wood, 1872; nec Seguenza, 1880].

This taxon is a primary homonym of *Nassa reticosa* var. *simplex* S.V.Wood, 1872.

N.trivittatus (Say, 1822)

1822. *Nassa trivittata* Say, J.Acad.Nat.Sci.Philadelphia 2:231 (Distribution is from Newfoundland to N.E. Florida).

N.vibex (Say, 1822)

1822. *Nassa vibex* Say, J.Acad.Nat.Sci.Philadelphia 2:231 (Shores of New Jersey).
1822. *Buccinum polygonatum* Lamarck, Hist.nat.anim.s.vert. 7:278 (No locality).
1843. *Nassa antillarum* d'Orbigny in Sagra *(pars)*, Hist.phys.polit.nat. l'ile Cuba, Moll. 2:141, pl.23, figs.1-3 (Cuba, St.Lucia; Florida and St.Thomas).
1849. *? Buccinum antillarum* Philippi, Zeit.f.Malakozool. 5:139 (Cuba) [non *Nassa antillarum* d'Orbigny, 1843].
1849. *Buccinum sturmii* Philippi, Zeit.f.Malakozool. 5:135 (Antilles, Ucatan).
1853. *Nassa cinisculus* Reeve, Conch.Icon. 8:pl.22, figs.146a,b (St.Thomas I).
1869. *Nassa fretensis* Perkins, Proc.Boston Sci.Nat.Hist. 13:117 (Newhaven).

Kaicher (1982) separated *N.vibex* from *N.polygonatus* on the basis of a lower spired shell and narrower columellar callus and from *cinisculus* on characters of a narrower still, angled columellar callus. None of these characters are of a constant nature and the outline of the columellar callus varies greatly (e.g. *N.arcularia*). The species *N.antillarum* d'Orbigny, is a composite species, but the majority of specimens are the species *N.vibex*. For a different interpretation of the taxon *N.antillarum*, a lectotype should be selected. It should be pointed out that a syntype of *N.cinisculus* Reeve illustrated by Cernohorsky (1975a) has the same columellar callus outline as *N.vibex* illustrated by Kaicher (1982).

CHECK-LIST OF MIO-PLIOCENE SPECIES OF NASSARIINAE FROM THE ATLANTIC – CARIBBEAN COAST OF AMERICA

Nassarius alumensis (Olsson, 1916)

1916. *Nassa alumensis* Olsson, Bull.Americ.Paleont. 5:133, pl.25, fig.5 (Alum Bluff, Miocene of Florida).

N.anisonemus (Gardner, 1944)

1944. *Uzita anisonema* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:475, pl.51, fig.16 (below Bailey's ferry, Chipola river, Calhoun Cty., Miocene of Florida).

N.aratus (Say, 1824)

1824. *Buccinum aratum* Say, J.Acad.Nat.Sci.Philadelphia (1), 4:127, pl.7, fig.4 (Miocene of Maryland).
1824. *Buccinum porcinum* Say, *ibid.*, 4:126, pl.7, fig.3 (Miocene of Maryland).
1931. *Ilyanassa (Paranassa) aratum deleonensis* Tucker, Proc.Indiana Acad.Sci. 40:375, textfig.1 (De Leon Springs, Caloosahatchie marl, Florida).

This species is the type-species of *Paranassa* Conrad, 1868.

N.beaumontensis (Aldrich, 1901)

1901. *Nassa beaumontensis* Aldrich, Nautilus 15(7):74, textfig. (oil well at Spindle Top Hill, Beaumont, 390 feet, Pleistocene of Texas).

The species is very similar to *N.acutus* (Say).

N.berthae (Maury, 1910)

1910. *Nassa berthae* Maury, Bull.Americ.Paleont. 4(21):21, pl.5, fig. 7 (Bailey's ferry, Chipola marls, Calhoun Cty., L.Miocene of Florida).

N.bidentatus (Emmons, 1858)

1858. *Buccinum bidentatum* Emmons, Nth.Carolina Geol.Surv.Rept. p.257, fig.126 (Duplin Cty., Miocene of Nth.Carolina).

N.bimitroditus (Gardner, 1944)

1944. *Uzita bimitrodita* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:479, pl.51, fig.25 (Oak Grove, Yellow River, Okaloosa Cty., Miocene of Florida).

N.blountensis (Mansfield, 1935)

1935. *Alectrion blountensis* Mansfield, Bull.Dept.Cons.Florida,Geol. 12:35, pl.2, fig.16 (Vaughan Creek, Walton Cty., Miocene of Florida).

N.calvertensis (Martin, 1904)

1904. *Nassa calvertensis* Martin, Maryland Geol.Surv.Publ. 2:191, pl.49, fig.1 (Plum Point, Calvert formation, Miocene of Maryland).

N.caloosaensis (Dall, 1890)

1890. *Nassa caloosaensis* Dall, Trans.Wagner Free Inst.Sci. 3:134, pl.9, fig.7 (Caloosahatchie marls, Pliocene of Florida).
1914. *Nassa cornelliana* Olsson, Bull.Americ.Paleont. 5(24):45, pl.11, fig.11.

N.caribaeus (Gabb, 1881)

1881. *Nassa caribae* Gabb, J.Acad.Nat.Sci.Philadelphia (2), 8:353, pl.46, fig.38 (Limon, Pliocene of Costa Rica).

N.cercadensis (Maury, 1917)

1917. *Alectrion cercadensis* Maury, Bull.Americ.Paleont. 5(29):90, pl.15, figs.19,20 (Rio Mao, Cercado formation, Miocene of the Dominican Republic).
1925. *Alectrion brassica* Maury, Bull.Americ.Paleont. 10(42):210, pl.36, fig.12 (M.Miocene of Trinidad).
1925. *Alectrion brassoensis* Mansfield, U.S.Nat.Mus.Proc. 66(22):46, pl.7, fig.3 (Miocene of Trinidad).

N.consensoides (Olsson, 1916)
1916. *Nassa consensoides* Olsson, Bull.Americ.Paleont. 5(27):13, pl.2, fig.10 (Natural Well, Duplin marl. U.Miocene of Nth.Carolina).
N.corbis (Olsson, 1967)
1967. *Ilyanassa corbis* Olsson, Paleont.Res.Inst.Ithaca p.34, pl.8, fig.2 (Fish Eating Creek, Pinecrest beds, Plio-Pleistocene of Florida).
N.chowanensis (Gardner, 1948)
1948. *Uzita chowanensis* Gardner, U.S.Geol.Surv.Prof.Pap. 199-B:249, pl.30, figs.9,10,12,13 (Colerain Landing, Hertford Cty., Miocene of Nth.Carolina).
N.cinclis (Gardner, 1944)
1944. *Uzita cinclis* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:472, pl.51, fig.8 (Tenmile Creek, Calhoun Cty., Miocene of Florida).
N.cystoides (Gardner, 1944)
1944. *Uzita cystoides* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:474, pl.51, fig.15 (below Bailey's ferry, Chipola River, Calhoun Cty., Miocene of Florida).
N.dalli (Maury, 1910)
1910. *Nassa dalli* Maury, Bull.Americ.Paleont. 4(21):21, pl.5, fig.8 (Oak Grove, Miocene of Florida).
N.dasa (Gardner, 1944)
1944. *Uzita dasa* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:480, pl.51, fig.26 (W. of Mossy Head, below Shell Bluff, Walton Cty., Miocene of Florida).
N.dasynemus (Gardner, 1944)
1944. *Uzita dasynema* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:473,pl.51,fig.9 (Below Bailey's Ferry, Chipola River, Calhoun Cty., Miocene of Florida).
1944. *Uzita dasynema cesta* Gardner, *ibid.*, 142-G:474, pl.51, fig.14 (below Bailey's ferry, Chipola River, Calhoun Cty., Miocene of Florida).
N.dryas (Gardner, 1944)
1944. *Uzita dryas* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:476, pl.51, fig.18 (Oak Grove, Okaloosa Cty., Miocene of Florida).
1944. *Uzita dryas leptalea* Gardner, *ibid.*, 142-G:477, pl.51, fig.19 (Oak Grove, Okaloosa Cty., Miocene of Florida).
N.dystaktus (Gardner, 1936)
1936. *Alectrion dystakta* Gardner, Florida State Dept.Cons.Geol.Bull. 14:58, pl.9, figs.6-8 (S.W. de Funiak Springs, Walton Cty., Miocene of Florida).
N.ethelinda (Dall, 1915)
1915. *Alectrion ethelinda* Dall, U.S.Nat.Mus.Bull. No.90:70, pl.13, fig.17 (Ballast Pt., Tampa Silex beds, Miocene of Florida).
N.eutyktus (Gardner, 1944)
1944. *Uzita eutykta* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:478, pl.51, figs.20,21 (Oak Grove, Yellow River, Okaloosa Cty., Miocene of Florida).
N.floridanus (Mansfield, 1930)
1930. *Alectrion floridana* Mansfield, Florida State Geol.Surv.Bull. No.3:76, pl.9, fig.7 (Hosford, Liberty Cty., U.Miocene of Florida).
N.floridanus (M.Smith, 1936)
1936. *Ilyanassa (Paranassa) floridana* M.Smith, Nautilus 49(4):138 pl.9, fig.5 (Clewsiton, Pliocene of Florida) [non *Alectrion floridana* Mansfield, 1930 = *Nassarius*].
This taxon is a secondary homonym of *Alectrion floridanus* Mansfield, 1930.
N.floridensis Olsson & Harbison, 1953
1953. *Nassarius (Uzita) floridensis* Olsson & Harbison, Acad.Nat.Sci.Philadelphia Mem. No.8:225, pl.33, figs.5,5a (St.Petersburg, Pliocene of Florida).
The species is very similar to *N.vibex* (Say).
N.galbanus Jung, 1969
1969. *Nassarius (?) galbanus* Jung, Bull.Americ.Paleont. 55:520, figs. (Pt.Courbaril, Pliocene of Trinidad).
N.galvestonensis (Harris, 1895)
1895. *Nassa galvestonensis* Harris, Bull.Americ.Paleont. 1(3):19, pl.4, fig.2 (deep well in Galveston, Texas, 2410 - 2871 feet, Upper Miocene).
N.gardnerae (Dall, 1915)
1915. *Alectrion gardnerae* Dall, U.S.Nat.Mus.Bull. No.90:70 (Tampa Silex beds, Miocene of Florida).
N.gastrophilus (Olsson, 1916)
1916. *Nassa gastrophila* Olsson, Bull.Americ.Paleont. 5(27):12, pl.1, fig.1 (Chowcowinity, Miocene of Nth.Carolina).
N.golfoyaquensis (Maury, 1917)
1917. *Tritia golfoyaquensis* Maury, Bull.Americ.Paleont. 5(29):256, pl.41, figs.24,25 (M.Miocene of Santo Domingo).

N.granifer (Conrad, 1868)

1868. *Ptychosalpinx (Paranassa) granifera* Conrad, Americ.J.Conch. 3(4):263, pl.19, fig.6 (Miocene of Virginia) [non *Buccinum graniferum* Kiener, 1834; nec Dujardin, 1837 = *Nassarius*].

This taxon is a secondary homonym of *N.granifer* (Kiener, 1834).

N.grapta (Gardner, 1936)

1936. *Alectrion grapta* Gardner, Florida State Dept.Conc.Geol.Bull. 14:60, pl.9, fig.9 (Shell Bluff, Shoal River, Walton Cty., Miocene of Florida).

N.greensboroensis (Martin, 1904)

1904. *Nassa greensboroensis* Martin, Maryland Geol.Surv.Publ. 2:194, pl.49, figs.5a,b (Greensboro, Choptank formation, Miocene of Maryland).

N.gubernatorius (Martin, 1904)

1904. *Nassa gubernatoria* Martin, Maryland Geol.Surv.Publ. 2:192, pl.49, fig.2 (Governor Run, Choptank formation, Miocene of Maryland).

N.gurabensis (Maury, 1917)

1917. *Alectrion gurabensis* Maury, Bull.Americ.Paleont. 5:255, pl.15, fig.21 (Rio Gurabo at Los Quemados, Miocene of the Dominican Republic).

1920. *Alectrion gurabensis* var. *portoricoensis* Hubbard, New York Acad.Sci. 3(2):151, pl.22, figs.12,13 and pl.24, fig.19 (Lares district, Quebradilla limestone, Miocene of Porto Rico).

1920. *Alectrion gurabensis varicum* Hubbard *ibid.*, 3(2):151, pl.22, figs.14,15 (Lares district, Quebradilla limestone, Miocene of Porto Rico).

N.harpuloides (Conrad, 1844)

1844. *Buccinum harpuloides* Conrad, Proc.Acad.Nat.Sci.Philadelphia 1:326 (Petersburg, Miocene of Virginia).

N.harrisi (Maury, 1910)

1910. *Nassa harrisi* Bull.Americ.Paleont. 4(21):22, pl.5, fig.9 (Bailey's ferry, Calhoun Cty., Chipola River, L.Miocene of Florida).

N.impressus (Lea, 1846)

1846. *Nassa impressa* Lea, Trans.Americ.Phil.Soc., N.S. 9(3):273, pl.37, fig.101 (Petersburg, Miocene of Virginia).

N.irroratus (Conrad, 1863)

1863. *Tritia irrorata* Conrad, Proc.Acad.Nat.Sci.Philadelphia for 1862:562; 1868 Conrad, Americ.J.Conch. 3:263, pl.19, fig.10 (Miocene of Sth.Carolina).

N.ischnus (Gardner, 1944)

1944. *Uzita ischna* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:478, pl.51, fig.22 (Oak Grove, Yellow River, Okaloosa Cty., Miocene of Florida) [non *Nassa ischna* Melvill, 1899 = *Nassarius*].

This taxon is a secondary homonym of *N.ischnus* (Melvill, 1899).

N.isogrammus (Dall, 1892)

1892. *Ilyanassa (Paranassa) isogramma* Dall, Trans.Wagner Free Inst.Sci. 3(2):239, pl.20, fig.16 (Bellefield, York City, Miocene of Virginia).

N.johnsoni (Dall, 1892)

1892. *Nassa johnsoni* Dall, Trans.Wagner Free Inst.Sci. 3(2):241, pl.13, fig.12 (Marl bed, Cape Fear River, Miocene of Nth.Carolina).

N.lapenotierei (Dall, 1890)

1890. *Nassa lapenotierei* Dall, Trans.Wagner Free Inst.Sci. 3(1):133, pl.9, fig.8 (Caloosahatchie beds, Pliocene of Florida).

N.locklini Olsson & Harbison, 1953

1953. *Nassarius (Uzita) locklini* Olsson & Harbison, Acad.Nat.Sci.Philadelphia Mon. No.8:224, pl.33, figs.2,2a (St.Petersburg, Pliocene of Florida).

N.losquemadicus (Maury, 1917)

1917. *Alectrion losquemadicus* Maury, Bull.Americ.Paleont. 5:255, pl.15, figs.22,23 (Rio Gurabo at Los Quemados, Miocene of the Dominican Republic).

N.marthae (Olsson, 1967)

1967. *Ilyanassa marthae* Olsson, Paleont.Res.Inst.Ithaca p.33, pl.8, fig.4 (Pinecrest beds, Kissimmee, Plio-Pleistocene of Florida).

N.marylandicus (Martin, 1904)

1904. *Nassa marylandica* Martin, Maryland Geol.Surv.Publ. 2:194, pl.49, figs.6-8 (St.Mary's River, Cove Pt., St.Mary's formation, Miocene of Maryland).

N.moniliformis (Emmons, 1858)

1858. *Buccinum moniliformis* Emmons, Rept.Nth.Carolina Geol.Surv. p.256, textfig.125 (Cape Fear, Miocene of Nth.Carolina).

N.multilineatus (Emmons, 1858)

1858. *Buccinum multilineatum* Emmons, Rept.Nth.Carolina Geol.Surv. p.256, textfig.124 (Cape Fear marls, Miocene of Nth.Carolina).

N.nanna (Gardner, 1944)
1944. *Uzita nanna* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:471, pl.51, figs.10,11 (N.W. of Mossy Head, Walton Cty., Miocene of Florida).

N.neogenensis (Gardner & Aldrich, 1919)
1919. *Alectrion neogenensis* Gardner & Aldrich, Proc.Acad.Nat.Sci.Philadelphia p.29, pl.1, figs.5,6 (Cronly, Columbus Cty., Mio-Pliocene of Nth.Carolina).

N.opeas (Gardner, 1944)
1944. *Uzita opeas* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:484, pl.51, fig.31 (below Bailey's ferry, Chipola River, Calhoun Cty., Miocene of Florida).

N.oxia (Gardner, 1944)
1944. *Uzita oxia* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:475, pl.51, fig.17 (below Bailey's ferry, Chipola River, Calhoun Cty., Miocene of Florida).

N.parapristus (Gardner, 1944)
1944. *Uzita paraprista* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:480, pl.51, fig.27 (S.W. of de Funiak Springs, Walton Cty., Miocene of Florida).
This species is the type-species of *Nanarius* Woodring, 1964.

N.pedanus (Gardner, 1944)
1944. *Uzita pedana* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:470, pl.51, figs.12,13 (Shell Bluff, Shoal River, Miocene of Florida).

N.peraltus (Conrad, 1868)
1868. *Ptychosalpinx (Tritiaria) peralta* Conrad, Americ.J.Conch. 3(4):264, pl.19, fig.5 (Miocene of Maryland).
1904. *Nassa peraltoides* Martin, Maryland Geol.Surv.Rept. 2:195, pl.49, fig.11 (Jones wharf, Choptank, Miocene of Maryland).

N.pristus (Gardner, 1944)
1944. *Uzita prista* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:481, pl.51, fig.28 (below Shell Bluff, Shoal River, Walton Cty., Miocene of Florida).

N.quadridentatus (Mansfield, 1930)
1930. *Alectrion quadridentatus* Mansfield, Florida State Geol.Surv.Bull. No.3:77, pl.9, fig.3 (Hosford, Liberty Cty., U.Miocene of Florida).

N.rabdotus (Gardner, 1944)
1944. *Uzita rabdota* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:485, pl.51, fig.34 (Gastropod Gulch, S.E. of Baibridge, Miocene of Georgia).

N.rasta Olsson & Harbison, 1953
1953. *Nassarius (Uzita) rasta* Olsson & Harbison, Acad.Nat.Sci.Philadelphia Mon. No.8:223, pl.33, fig.8 (St.Petersburg, Pliocene of Florida).

N.scalarispira (Conrad, 1868)
1868. *Ptychosalpinx scalarispira* Conrad, Americ.J.Conch. 3(4):263, pl.19, fig.4 (Miocene of Virginia).

N.schizopyga (Dall, 1892)
1892. *Ilyanassa (Porcina* var.?) *schizopyga* Dall, Trans.Wagner Free Inst.Sci. 3(2):238 (marl beds, Cape Fear, Miocene of Nth.Carolina).

N.sexdentatus (Conrad, 1843)
1843. *Buccinum sexdentatum* Conrad, Proc.Acad.Nat.Sci.Philadelphia 1:308 (Miocene of Nth.Carolina).

N.smithianus (Olsson, 1916)
1916. *Nassa smithiana* Olsson, Bull.Americ.Paleont. 5(27):12, pl.1, fig.2 (Natural Wells, Duplin Cty., U.Miocene of Nth.Carolina).

N.soporus (Pilsbry & Harbison, 1934)
1934. *Nassa sopora* Pilsbry & Harbison, Proc.Acad.Nat.Sci.Philadelphia 85:114, pl.3, figs.9,10 (Sea sile City, Miocene of New Jersey).

N.suffolkensis (Gardner, 1948)
1948. *Uzita suffolkensis* U.S.Geol.Surv.Prof.Pap. 199-B:251, pl.30, figs.2,3 (N.E. of Suffolk, Nansemond Cty., Miocene of Virginia).

N.tribakus (Gardner, 1944)
1944. *Uzita tribaka* Gardner, U.S.Dept.Int.Prof.Pap. 142-G:479, pl.51, fig.29 (below Bailey's ferry, Chipola River, Calhoun Cty., Miocene of Florida).

N.trinitatensis Jung, 1969
1969. *Nassarius (Uzita) trinitatensis* Jung, Bull.Americ.Paleont. 55:518, figs. (Melajo River, Springvale formation, Miocene of Trinidad).

N.trivigalvestus (Harris, 1895)
1895. *Nassa trivigalvesta* Harris, Bull.Americ.Paleont. 1(3):19, pl.4, fig.3 (deep well at Galveston, 2158 - 2871 feet, U.Miocene of Texas).

N.trivittatoides (Whitfield, 1894)

1894. *Tritia trivittatoides* Whitfield, Mon.U.S.Geol.Surv. 24:104, pl.19, figs.1-3 (Miocene of New Jersey and Maryland).

1894. *Tritia trivittatoides elongata* Whitfield, *ibid.*, 24:105, pl.19, figs.4-6 (Miocene of New Jersey and Maryland) [non *Nassa elongata* S.V. Wood, 1848; nec Marrat, 1874 = *Nassarius*].

N.ursula (Dall, 1915)

1915. *Alectrion ursula* Dall, U.S.Nat.Mus.Bull. No.90:69, pl.12, fig.13 (Ballast Pt., Tampa Bay, Tampa Silex beds, Miocene of Florida).

N.veatchi (Maury, 1910)

1910. *Nassa veatchi* Maury, Bull.Americ.Paleont. 4(21):22, pl.5,fig.10 (Bailey's ferry, Chipola marls, L.Miocene of Florida).

N.waltonensis (Gardner, 1936)

1936. *Alectrion waltonensis* Gardner, Florida State Dept.Conc.Geol.Bull. 14:54, pl.9, figs.3,4 (Shell Bluff, Shoal River, Walton Cty., Miocene of Florida).

1936. *Alectrion waltonensis deleta* Gardner, *ibid.*, 14:56, pl.9, fig.5 (below Shell Bluff, Shoal River, Walton Cty., Miocene of Florida).

N.watsoni (Maury, 1910)

1910. *Phos watsoni* Mauri, Bull.Americ.Paleont. 4:21, pl.5, fig.6 (Oak Grove, Santa Rosa Cty., Miocene of Florida) [non *Nassa watsoni* Kobelt, 1887 = *Nassarius*].

1944. *Uzita watsoni* (Maury), Gardner, U.S.Dept.Int.Prof.Pap. 142-G:471, pl.51, fig.6.

This taxon is a secondary homonym of *N.watsoni* (Kobelt, 1887).

N.wilmingtonensis (Gardner, 1948)

1948. *Ilyanassa wilmingtonensis* Gardner, U.S.Geol.Surv.Prof.Pap. 199-B:244, pl.30, figs.30,31 (Wilmington, Miocene of Nth.Carolina).

N.zeta (Gardner, 1948)

1948. *Uzita zeta* Gardner, U.S.Geol.Surv.Prof.Pap 199-B:252, pl.28, figs.1,7 (Cronly, Columbus Cty., Miocene of Nth.Carolina).

DUBIOUS SPECIES AND SPECIES EXCLUDED FROM THE NASSARIINAE FROM THE ATLANTIC – CARIBBEAN COAST OF AMERICA

Nassa cancellata Lea, 1833

1833. *Buccinum sagenum* Conrad, Foss.shells Tert.Nth.America p.34 (publ. August 1833).

1833. *Nassa cancellata* Lea, Contrib.Geol. p.165, pl.5, fig.170 (Claiborne, Eocene of Alabama) [publ. post 1 November 1833].

According to Dall (1890) the species is a synonym of *Buccitriton sagenus* (Conrad, 1833), family Buccinidae.

Nassa fuegina Steinmann & Wilckens, 1908

1908. *Nassa fuegina* Steinmann & Wilckens, Arkiv.f.Zool.Stockholm 4(6):65, pl.7, figs.1a,b (Carmen Silva, Tierra del Fuego, South America, Tertiary).

This species belongs to the Antarctic genus *Chlanidota* v.Martens, 1878, family Buccinidae.

Nassa globosa Gabb, 1877

1877. *Nassa globosa* Gabb, Proc.Acad.Nat.Sci.Philadelphia for 1876, Pt.3:282 (Ripley formation, Cretaceous of Nth.Carolina and Georgia) [non Sowerby, 1828].

This species belongs to the buccinid genus *Seminola* Wade, 1917. Gabb's taxon is a primary homonym of *Nassa globosa* Sowerby, 1828.

Nassa guadelupensis Petit de la Saussaye, 1852

1852. *Nassa guadelupensis* Petit de la Saussaye, J.Conchyl. 3:56, pl.2, figs.3,4 (Sth. of Great Bay, Fleur-d'Epée, Guadeloupe).

The species is a synonym of *Phos (Engoniophos) unicinctus* (Say, 1826), from the Caribbean.

Nassa isabellei d'Orbigny, 1841 (Fig.103)

1841. *Nassa isabellei* d'Orbigny, Voy.Americ.Merid., Moll. p.433, pl.61, figs.18-21 (Patagonia).

The holotype is in the British Museum (Nat.Hist.) No.1854.12.4.468. The species belongs to the genus *Anachis* H. & A.Adams, family Columbellidae.

Alectrion jacksonensis Cooke, 1926.

1926. *Alectrion jacksonensis* Cooke, Washington Acad.Sci.J. 16(5):136, fig.7 (Jackson, Eocene of Mississippi).

The species belongs to the genus *Buccitriton* Conrad, 1865, family Buccinidae.

Nassa lunata Say, 1826

1826. *Nassa lunata* Say, J.Acad.Nat.Sci.Philadelphia 5:213 (coast of southern States and Maryland, U.S.A.)

This species belongs to the genus *Mitrella* Risso, 1826, family Columbellidae.

Buccinum (Nassa) cancellatum molitum de Gregorio, 1890.

1890. *Buccinum (Nassa) cancellatum molitum* de Gregorio, Ann.geol.paleont. Palermo 7/8:103, pl.8, fig.3 (Eocene of Alabama).

This species is a synonym of *Buccitriton sagenus* (Conrad, 1833), family Buccinidae.

Fig. 103. *Nassa isabellei* d'Orbigny. Patagonia. Holotype BM(NH) No. 1854.12.4.468.; 3.8 mm (= *Anachis isabellei,* family Columbellidae).

Nassa multilineata Marrat, 1877.

1877. *Nassa multilineata* Marrat, Prop.new forms genus *Nassa* p.11 (South America) [non *Buccinum multilineatum* Emmons, 1858 = *Nassarius*].

The types are lost and the species is not identifiable from the description alone. It is also a secondary homonym of *N.multilineatus* (Emmons, 1858).

Nassa pallida Powys, 1835 .

1835. *Nassa pallida* Powys, Proc.Zool.Soc.Lond. Pt.3:96 (Panama).

1974. *Phos (? Strongylocera) pallidus* (Powys), Cernohorsky, Rec.Auckland Inst.Mus. 11:129, figs.20,21 (figd.syntypes).

The species is a synonym of *Phos (Engoniophos) unicinctus* (Say, 1826), family Buccinidae, from the Caribbean.

Nassa pleona Aldrich, 1921.

1921. *Nassa pleona* Aldrich, Bull.Americ.Paleont. 9(37):12, pl.1, figs.25,26 (Lisbon, Eocene of Alabama).

This Eocene species is either a Buccinacean or Muricacean gastropod.

Nassa quadrata Conrad, 1830.

1830. *Nassa quadrata* Conrad, J.Acad.Nat.Sci.Philadelphia 6:226, pl.9, fig.16 (St.Mary's Cty., Miocene of Maryland).

This species belongs to *Bulliopsis* Conrad, 1862, subfamily Dorsaninae.

Buccinum (Nassa) cancellatum sapidum de Gregorio, 1890.

1890. *Buccinum (Nassa) cancellatum* var. *sapidum* de Gregorio, Ann.geol.paleont. Palermo 7/8:103, pl.8, fig.1 (Eocene of Alabama).

This species is a synonym of *Buccitriton sagenus* (Conrad, 1833), family Buccinidae.

Nassa subcylindrica Conrad, 1866.

1866. *Nassa (Bulliopsis) subcylindrica* Conrad, Americ.J.Conch. 2(1):66, (Miocene of Maryland).

This species belongs to *Bulliopsis* Conrad, 1862, subfamily Dorsaninae.

Nassa unicincta Say, 1826.

1826. *Nassa unicincta* Say, J.Acad.Nat.Sci.Philadelphia 5:211 (coast of Sth.Carolina).

The species belongs to the photine genus *Engoniophos* Woodring, 1928, family Buccinidae.

Nassa (Ilyanassa) vallentini Melvill & Standen, 1907.

1907. *Nassa (Ilyanassa) vallentini* Melvill & Standen, Trans.R.Soc.Edinburgh 46(1):138, pl.46, figs.8,8a (Port William, Falkland Is).

This Falkland Island species appears to be an immature specimen of Buccinidae. It bears no relationship to North American species of *Ilyanassa*.

Buccinum zonale Bruguière, 1789.

1789. *Buccinum zonale* Bruguière, Encycl.Meth.Hist.nat.vers. 1:271 (ref. Gualtieri, pl.44, fig.M) [Santo Domingo = error].

The description and reference cited suggest a *Nassarius* species of the subgenus *Plicarcularia* Thiele. Species of the latter subgenus do not live in the Caribbean region, the species remain unidentifiable and the locality of "Santo Domingo" is also suspect.

Bravard (1857) listed, but did not describe, the following species from Punto Alta, Argentina: *Nassa cylindrica, N.ovata, N.globulosa, N.marginata, N.terebrata, N.punctulata* and *N.sowerbyi*. These taxa are all *nomina nuda*.

The following species described by de Gregorio (1890) from the Eocene of Alabama, belong to the photine Buccinidae: *Buccinum (Nassa) confiscatum; B.(N.)impectens; B.(N.)iterandum; B.(N.)lucrifactum; B.(N.)mangonizatum* and *B.(N.)prostratum*.

CHECK-LIST OF GENERIC GROUPS BASED ON SPECIES FROM EUROPEAN SEAS AND THE EAST ATLANTIC

Subgenus *Sphaeronassa* Locard, 1886

Sphaeronassa Locard, 1886, Prodr.Malac.Francaise pp.132,548. Type species by OD *Buccinum mutabile* Linnaeus, 1758. Recent, Mediterranean Sea.

1890. *Nasseburna* de Gregorio, Ann.Geol.Paleont.Palermo 7/8:108. Type species by OD *Buccinum mutabile* Linnaeus, 1758.

Subgenus *Naytia* H. & A.Adams, 1853.

Naytia H. & A.Adams, 1853, Gen.Rec.Moll. 1:118. Type species by SD (Cossmann, 1901) *Strombus glabratus* Sowerby, 1842. Recent, West Africa.

The type species is usually cited as *Buccinum obliquum* Kiener, 1841, but this taxon is a primary homonym of *B.obliquum* Gmelin, 1791.

Subgenus *Naytiopsis* Thiele, 1929

Naytiopsis Thiele, 1929, Handb.syst.Weicht. 1:324. Type species by M *Nassarius (Naytiopsis) granum* Lamarck = *Buccinum granum* Lamarck, 1822. Recent Mediterranean Sea.

Subgenus *Telasco* H. & A.Adams, 1853

Telasco H. & A.Adams, 1853, Gen.Rec.Moll. 1:119. Type species by SD (Bucquoy, Dautzenberg & Dollfus, 1882) *Nassa variabilis* (Philippi) = *Buccinum variabile* Philippi, 1836 = *B.cuvierii* Payraudeau, 1826. Recent, Mediterranean Sea.

1936. *Tarazeuxis* Iredale, Rec.Australian Mus. 19:322. Type species by OD *Nassa mucronata* A.Adams, 1852 = *Nassa gaudiosa* Hinds, 1844. Recent, Indo-Pacific. (*Nomen nudum* — diagnosis lacking).

Subgenus *Adinopsis* Odhner, 1923

Adinopsis Odhner, 1923, Goteborg Kungl.Vet.Handl. 26(7):15. Type species by M *A.skoogi* Odhner, 1923. Recent, West Africa (Non *Adinopsis* Cameron, 1918, in Coleoptera).

Wenz (1943) erred in placing *Adinopsis* in the Dorsaninae as a subgenus of *Dorsanum*. The animal of *A.skoogi* has 2 metapodial tentacles, and like the operculum, is closer to *Nassarius* than to *Bullia* or *Dorsanum*. The shell of *A.skoogi* is closely similar to the West and South African species *Nassarius vinctus* (Marrat). *Adinopsis* Odhner, (1923), is a primary homonym of *Adinopsis* Cameron, 1918, but no substitute is proposed since another generic group would prove superfluous.

Subgenus *Gussonea* Monterosato, 1912

Gussonea Monterosato, 1912, J.Conchyl. 59(4):295. Type species by M *Nassa tinei* Maravigna, 1840. Recent, Mediterranean Sea.

1853. *Amycla* H. & A.Adams, Gen.Rec.Moll. 1:186. Type species by SD (Bucquoy, Dautzenberg & Dollfus, 1882) *Buccinum corniculum* Olivi, 1792. Recent, Mediterranean Sea (non *Amycla* Rafinesque, 1815; nec Doubleday, 1849).

1918. *Amyclina* Iredale, Proc.malac.Soc.Lond. 13:28,31. Type species (art.67(i) of ICZN) *Buccinum corniculum* Olivi, 1792 (nom.subst. pro *Amycla* H. &.Adams, 1853).

1972. *Fackia* Nordsieck, Mioz.Moll.Miste-Winterswijk p.78. Type species by OD *Nassa facki* Koenen, 1872. Hemmoor, Miocene of Germany.

Subgenus *Hinia* Gray, 1847

Hinia Gray, 1847, Ann.Mag.Nat.Hist. 20:269. Type species by SD (Cossmann, 1901) *Buccinum reticulatum* Linnaeus, 1758. Recent, Mediterranean Sea.

1853. *Tritia* A.Adams (ex-Risso MS), Proc.Zool.Soc.Lond. Pt.19:112. Type species by SD (Oostingh, 1939) *Planaxis reticulata* (L.) = *Buccinum reticulatum* Linnaeus, 1758.

1972. *Miohinia* Nordsieck, Mioz,Moll.Miste-Winterswijk p.79. Type species by OD *Nassa bocholtensis* Beyrich, 1854. Miocene of Germany.

Subgenus *Hima* Leach in Gray, 1852

Hima Leach in Gray, 1852, Moll.Brit.Synop. p.123. Type species by SD (Marwick, 1931) *Buccinum minutum* Pennant, 1777 = *B.incrassatum* Stroem, 1768. Recent, Mediterranean and European Seas.

1852. *Tritonella* A.Adams, Proc.Zool.Soc.Lond. p.111 (non *Tritonella* Swainson, 1839).

1931. *Mirua* Marwick, N.Z. Geol.Surv.Paleont.Bull. No.13:115. Type species by OD *Nassa socialis* Hutton, 1886. Miocene of New Zealand.

1936. *Reticunassa* Iredale, Rec.Austral.Mus. 19(5):322. Type species by OD *Nassa paupera* Gould, 1850. Recent, Indo-Pacific.

Subgenus *Uzita* H. & A.Adams, 1853

Uzita H. & A.Adams, 1853, Gen.Rec.Moll. 1:120. Type species by SD (Cossmann, 1901) *Buccinum miga* Bruguière, 1789. Recent, Mediterranean Sea – West Africa.

1936. *Usita* Noszky, Ann.Mus.Nat.Hung. 30:68 *(nom.van.)*

Genus *Cyclope* Risso, 1826

Cyclope Risso, 1826, Hist.nat.princip.Prod.Europ.merid. 4:170, 271. Type species by SD (Keen, 1964) *C.neritoidea* Risso, 1826 = *Buccinum neriteum* Linnaeus, 1758. Recent, Mediterranean and European Seas (Opinion 793 of ICZN).

1810. *Cyclops* Montfort, Conch.Syst. 2:370. Type species by OD *C.asterizans* Montfort, 1810 = *Buccinum neriteum* Linnaeus, 1758 (non *Cyclops* Mueller, 1776).

1817. *Nana* Schumacher, Essai nouv.syst. p.225. Type species by T *Fabula nana* Chem. = *Buccinum neriteum* Linnaeus, 1758 (name suppressed in Opinion 793 of ICZN).

1826. *Nanina* Risso, Hist.nat.princip.Prod.Europ.merid. 4:150. Type species by M *N.unifasciata* Risso, 1826 = *Buccinum neriteum* Linnaeus, 1758.

1840. *Cyclonassa* Swainson, Treat.Malac. pp.69,300. Type species by M *C.neritea* = *Buccinum neriteum* Linnaeus, 1758.

1840. *Panormella* Costa, Fauna Siciliae (1), Panorm. No.1. Type species by M *P.lofasi* Costa, 1840 = *Buccinum neriteum* Linnaeus, 1758.

1844. *Nannia* Philippi, Enum.Moll.Siciliae 2:286 (nom.subst.pro. *Nanina* Risso, 1826).

1848. *Cencus* Gistel, Nat.Thierreich p.viii. Type species (art.67(i) of ICZN) *C.asterizans* Montfort, 1810 = *Buccinum neriteum* Linnaeus, 1758 (nom.subst.pro. *Cyclops* Montfort, 1810).

1848. *Cyclocyrtia* Agassiz, Nom.zool.Ind.Univ. p.316 (invalid emendation for *Cyclonassa* Swainson, 1840).

1852. *Neritula* Herrmannsen, Ind.gen.Malak., Suppl. p.93. Type species by OD *Buccinum neriteum* Linnaeus, 1758.

Subgenus *Proneritula* Thiele, 1929

Proneritula Thiele, 1929, Handb.syst.Weicht. 1:324. Type species by M *Nassa (Proneritula) westerlundi* (Brusina) = *Cyclope westerlundi* Brusina, 1900. Recent, brackish water, Greece.

CHECK-LIST OF RECENT SPECIES OF NASSARIINAE FROM EUROPE AND THE EAST ATLANTIC

Species from this faunal region have been monographed by Nordsieck (1968), and have also been treated in papers by Adam & Glibert (1976) and Adam (1976).

In species with an unusually large number of synonyms, literature references have been omitted.

Nassarius albus (Say, 1826)

1799. *? Buccinum ambiguum* Pulteney, Cat. Birds Dorset p.42 (non Solander, 1766).

1826. *Nassa alba* Say, J.Acad.Nat.Sci.Philadelphia 5:212 (southern coast of E.Florida and the West India Islands).

This West Atlantic species has been recorded from the East Atlantic coast of France by Locard (1887) who also proposed the varietal names *minor, ventricosa, fulva* and *azonata*. For further remarks and a more detailed synonymy see the check-list of West Atlantic – Caribbean species. *Hinia (Tritonella) farolita* Nordsieck, 1968, is very similar to *N.albus* (Say) and may prove conspecific.

N.argenteus (Marrat, 1877)

1877. *Nassa argentea* Marrat, Some prop.new forms *Nassa* p.9, pl.1, fig.21 (Whydah, West Africa).

1884. *Nassa argentea* var. *multicostata* v. Maltzan, Nachr.deut.Malak.Gesell. 16:70 (Gorée, West Africa, 10-15 m) [non A.Adams, 1852].

N.brychia (Watson, 1882)

1882. *Nassa (Tritia) brychia* Watson, J.Linn.Soc.Lond. 16:365 (off Goomera, Canary Is, 1135 m).

N.cinctellus (A.Adams, 1852)

1852. *Nassa cinctella* A.Adams, Proc.Zool.Soc.Lond. p.110 (St.Helena, 37 m). [non Gould, 1850].

This taxon is a primary homonym of the Indo-Pacific *N.cinctellus* (Gould, 1850).

N.circumcinctus (A.Adams, 1852)

1852. *Nassa circumcincta* A.Adams, Proc.Zool.Soc.Lond. p.102 (Red Sea).

1972. *Naytiopsis granum flammulata* Nordsieck, Arch.Moll. 102 (4-6):238, textfig.39 (Shiqmona Bay, Israel); 1975 Yaron, Conchiglie 11(1-2):34 (placed in synonymy of *N.circumcinctus* A.Adams) [non *Nassa flammulata* Preston, 1909; nec Schepman, 1911].

The species has been introduced into the Red Sea from the Mediterranean. Mienis (1980) considers *N.circumcinctus* to be endemic to the Eastern Mediterranean. The species is supposed to be easily separated from *N.gibbosulus* (Linnaeus) on the basis of slender shape, truncated top, lack of dorsal hump (a very variable feature) and colouring. The existing type of *N.circumcinctus* does not fully conform to the above diagnosis. *Naytiopsis granum flammulata* Nordsieck, is a juvenile specimen of *N.circumcinctus* and is also a secondary homonym of *Nassa flammulata* Preston, 1909 and Schepman, 1911. The taxa *lactea* Pallary, 1913 (non Marrat, 1880) and *minor* Pallary, 1913 (non Marrat, 1877) have been proposed as varietal names of *N.circumcinctus*.

N.clathratus (Born, 1778)

1778. *Buccinum clathratum* Born, Index Mus. Caes. Vindob. p.255; 1780 Born, Test.Mus.Caes.Vindob. p.261, pl.9, figs.17,18 (No locality).
1852. *Nassa turrita* A.Adams, Proc.Zool.Soc.Lond. p.110 (No locality) [non Borson, 1820].
1852. *Nassa subclathrata* d'Orbigny, Prodr.paleont. & Strat.Univ. 3:176 (nom.subst.pro *Buccinum clathratum* Brocchi, 1814, pl.9, figs.17,18).
1891. *Nassa ficaratiensis* Monterosato, Boll.Soc.Sci.Nat.Palermo No.11:4 (Ficarazzi, Pleistocene of Italy).

The species has been reported living from off the West African coast in 108 m, and also occurs in Pliocene deposits of Italy.

N.conspersus (Philippi, 1849)

1849. *Buccinum conspersum* Philippi, Zeit.f.Malakozool. 5:139 (Canary Is).

N.corniculus (Olivi, 1792)

1792. *Buccinum corniculum* Olivi, Zool. Adriat. p.144 (Adriatic Sea).

The following taxa are synonyms: *Buccinum fasciolatum* Lamarck, 1822 (non Gmelin, 1791); *B.dermestoideum* Payraudeau, 1826 (non Lamarck, 1822); *B.calmeilii* Payraudeau, 1826; *Planaxis olivacea* Risso, 1826, (non *Buccinum olivaceum* Bruguière, 1789 = *Nassarius*); *Planaxis discrepans* Risso, 1826; *P.trifasciata* Risso, 1826 (non *Buccinum trifasciatum* Gmelin, 1791 = *Nassarius*); *Buccinum oblongum* Sassi, 1827; *B.semiplicatum* O.Costa, 1829; *B.politum* Bivona, 1832 (non Roeding, 1798); *B.fusca* Scacchi, 1836; *B.decollatum* Philippi, 1844; *Nassa sparta* Marrat, 1877; *N.flava* Marrat, 1877; *N.gibberula* Marrat, 1880; *N.quercina* Marrat, 1880; *Amycla albomaculata* Bucquoy, Dautzenberg & Dollfus, 1882; *A.atrata* Bucquoy, Dautzenberg & Dollfus, 1882; *A.carneola* Bucquoy, Dautzenberg & Dollfus, 1882; *A.flavida* Bucquoy, Dautzenberg & Dollfus, 1882; *A.lineolata* Bucquoy, Dautzenberg & Dollfus, 1882 (non Grateloup, 1834); *A.minor* Bucquoy, Datuzenberg & Dollfus, 1882 (non Marrat, 1877); *A.punctulata* Bucquoy, Dautzenberg & Dollfus, 1882; *N.dautzenbergi* de Gregorio, 1885; *N.mitrella* de Gregorio, 1885; *N.aurea* Pallary, 1900; *A.luteostoma* Coen, 1933 (non *Nassa luteostoma* Broderip & Sowerby, 1829).

N.crossei (v.Maltzan, 1884)

1884. *Nassa crossei* v.Maltzan, Nachr.deut.malak.Gesell. 16(5):69 (Gorée, Senegal, W.Africa, 10-15m) [non *Buccinum crossei* Mayer, 1862 = *Nassarius*].

This taxon is a secondary homonym of *Nassarius crossei* (Mayer, 1862).

N.cuvierii (Payraudeau, 1826)

1804. *Buccinum costulatum* Renieri, Tavola alf.Conch.Adriatica p.ix (work suppressed in Opinion 316 of ICZN).
1826. *Buccinum cuvierii* Payraudeau, Cat.moll.Corse p.163, pl.8, figs.17,18 (Corsica, Italy).

The following taxa are synonyms: *Buccinum ferussaci* Payraudeau, 1826; *Planaxis lineolata* Risso, 1826; *P.molliana* Risso, 1826; *P.donatiana* Risso, 1826; *P.fitcheliana* Risso, 1826; *P.loques* Risso, 1826; *P.riparia* Risso, 1826; *P.tenuis* Risso, 1826; *? Buccinum subdiaphanum* Bivona, 1832; *B.unifasciatum* Kiener, 1834; *B. variabile* Philippi, 1836; *Nassa nigrescens* Requien, 1848; *N.atra* Brusina 1869; *N.castanea* Brusina, 1869; *N.zonata* Brusina 1869; *N.lanceolata* Bucquoy, Dautzenberg & Dollfus, 1882; *N.pulcherrima* Bucquoy, Datzenberg & Dollfus, 1882 (non Marrat, 1877); *N.tenuicosta* Bucquoy, Dautzenberg & Dollfus, 1882; *N.turgida* Bucquoy, Dautzenberg & Dollfus, 1882; *N.varicosa* Bucquoy, Dautzenberg & Dollfus, 1882 (non Turton, 1825); *N.guernei* Locard, 1886; *N.mabillei* Locard, 1887; *N.claudoni* Pallary, 1906; *N.pallaryi* Pallary, 1906 (*ex*-Koch MS); *N.dautzembergi (sic)* Mari, 1928 (non *N.dautzenbergi* de Gregorio, 1885; nec Harmer, 1914); *Hima candida* Coen, 1937; *N.louisi* Pallary, 1938.

N.denticulatus (A.Adams, 1852)

1852. *Nassa denticulata* A.Adams, Proc.Zool.Soc.Lond. p.110 (No locality).
1876. *Nassa limata* var. *conferta* v.Martens, Jahrb.deut.Malak.Gesell. 3:239, pl.9, fig.3 (near Cape Verde Is, 23°04'W & 16°40'N, 86 m); 1881 v. Martens, Conch.Mittheil. 2:113, pl.22, figs.14-16.
1878. *Nassa renovata* Monterosato, Giorn.Sci.nat.Econ. 13:43.

N.elatus (Gould, 1845)

1845. *Nassa elata* Gould, Proc.Boston Soc.Nat.Hist. 2:38; 1845 Gould, Boston J.Nat.Hist. 5:293, pl.24, fig.11 (Liberia, West Africa).
1862. *Nassa gallandiana* Fischer, J.Conchyl. 10:37; 1863 Fischer, J.Conchyl. 2:81, pl.11, fig.6 (Bay of Lagos, Portugal and Cadix, Spain).
1878. *Nassa interstincta* Marrat, Quart.J.Conch. 1:381 (Corisco Bay, W.Africa).
1881. *Columbella buchholzi* v.Martens, Conch.Mittheil. 2(1/2):118, pl.23, figs.8-10 (Victoria, Gulf of Guinea, W.Africa).

1887. *Nassa gallandiana* var. *monochroma* Locard, Contrib.faune Malac.Franc. 10:88 (Gulf of Gascogne, France).
1887. *Nassa gallandiana* var. *albida* Locard, *ibid.*, 10:88 (Gulf of Gascogne, France).

N.frigens (v.Martens, 1878)
1878. *Nassa frigens* v.Martens, Sitz.-Ber.Gessel.natur.Freunde p.134; 1881 v.Martens, Conch.Mittheil.2:114, pl.22, figs.17,18 (coast of W.Africa, 10°12.9'N & 17°25.5'W, 659 m).
1973. *Hinia frigens malacitanae* Quiles, Conchiglie, Unione Malac.Ital. 9(11-12):234, pl.3, figs.1-4 (Straits of Gibraltar, *c.* 1400 m).

N.fuscescens (Dautzenberg, 1912)
1912. *Nassa (Hima) fischeri* Dautzenberg, Ann.l'Inst.Ocean.Monaco 5(3):31, pl.1, figs.37,38 (Mossamedes Bay, 15-35 m; Mossamedes Beach; Praya-Amelia Bay, West Africa) [non Bellardi, 1882].
1912. *Nassa (Hima) fischeri* var. *fuscescens* Dautzenberg, *ibid.*, 5(3):32 (Mossamedes Bay, 15-35 m, West Africa).

The taxon *Nassa fischeri* Dautzenberg, being a primary hononym of *N.fischeri* Bellardi, 1882, Dautzenberg's varietal name *fuscescens* has been adopted for this species.

N.gibbosulus (Linnaeus, 1758)
1758. *Buccinum gibbosulum* Linnaeus, Syst.Nat.ed.10:737 (ref.Gualtieri, pl.44, fig.L) [Mediterranean Sea].
1798. *Cassis callosa* Roeding, Mus.Bolten. p.28 (ref. Knorr, pt.6:pl.22, fig.6 (No locality).
1913. *Arcularia gibbosula obscura* Pallary, Mem.Inst.Egypt 6:56.

N.glabratus (Sowerby, 1842)
1841. *Buccinum obliquum* Kiener, Spéc.gen.icon.coq.viv. 9:107, pl.31, fig.4 (coasts of Senegal) [non Gmelin, 1791].
1842. *Strombus glabratus* Sowerby, Thes.Conchyl. 1(1):32, pl.8, figs.66,67 (No locality).
1872. *Nassa (Naytia) glabrata* Sowerby, E.A.Smith, Proc.Zool.Soc.Lond. for 1871:732 (Whydah, W.Africa).

This is the type-species of *Naytia* H. & A.Adams, 1853. *Buccinum obliquum* Kiener, 1841, being a primary homonym of *B.obliquum* Gmelin, 1791, has to be replaced with *glabratus* Sowerby.

N.grana (Lamarck, 1822)
1822. *Buccinum grana* Lamarck, Hist.nat.anim.s.vert. 7:274 (No locality).
1826. *Planaxis laevigata* Risso, Hist.nat.Europ.merid. 4:175 (Mediterranean).
1900. *Nassa granum* var. *elongata* Pallary, J.Conchyl. 48:276 (Oran, Algeria) [non S.V.Wood, 1848; nec Marrat, 1874].
1900. *Nassa granum* var. *varicosa* Pallary, J.Conchyl. 48:276 (Oran, Algeria) [non Bucquoy, Dautzenberg & Dollfus, 1882].

This species is the type-species of *Naytiopsis* Thiele, 1929.

N.incrassatus (Stroem, 1768)
1768. *Buccinum incrassatum* Stroem, Kongl.Norske Vidensk.Selsk.Scr. 4:369, pl.16, fig.25.

The following taxa are synonyms: *Buccinum minutum* Pennant, 1777; *B.ascanias* Bruguière, 1789; *B.macula* Montagu, 1803; *B.coccinella* Lamarck, 1822; *B.lacepedii* Payraudeau, 1826; *Planaxis rosacea* Risso, 1826; *P.affinis* Risso, 1826; *P.desmarestiana* Risso, 1826; *Nassa intermedia* Forbes, 1844; *N.rosacea* Reeve, 1854; *N.delicata* Reeve, 1854 (non A.Adams, 1852); *N.tenella* Reeve, 1854; *N.deshayesii* Drouet, 1858 (non Rousseau, 1854); *N.saxatilis* Brusina, 1870; *N.elongata* Bucquoy, Dautzenberg & Dollfus, 1882 (non Marrat, 1874); *N.varicosa* Bucquoy, Dautzenberg & Dollfus, 1882 (non Turton, 1825); *N.goreensis* v.Maltzan, 1884; *N.senegalensis* v.Maltzan, 1884; *N.interjecta* Locard, 1886; *N.jousseaumi* Locard, 1886; *N.valliculata* Locard, 1886.

N.johni (Monterosato, 1889)
1889. *Nassa johni* Monterosato, J.Conchyl. 37:114 (Casablanca, Morocco, 4-5 m).
1946. *Nassa johni* var. *dakarensis* Fischer-Piette & Nickles, J.Conchyl. 87(2):65, pl.1, fig.1 (Dakar, W.Africa).

N.liberiensis (Knudsen, 1956)
1956. *Nassa liberiensis* Knudsen, Atlantide Rept. No.4:51, pl.1, fig.10 (off Port Marshall, Liberia, W.Africa).

N.lima (Dillwyn, 1817)
1795. *"Buccinum lima"* Chemnitz, Neues syst.Conch.-Cab. 11:87, pl.188, figs.1808,1809 (East Indies = error) [non binomial].
1817. *Buccinum lima* Dillwyn, Cat.Rec.shells 2:636 (ref.Chemnitz, *op.cit.*, figs.1808,1809) [East Indian Seas = error].
1834. *Buccinum scalariforme* Kiener, Spéc.gen.icon.coq.viv. 9:79,pl.21, fig. 80 (Indian Ocean = error).
1836. *Buccinum limatum* Philippi, Enum.Moll.Siciliae, p.220 (ref.Chemnitz, *op.cit.*, figs.1808,1809) [Mediterranean].
1844. *Buccinum limatum* Deshayes in Deshayes & Edwards, Hist.nat.anim.s.vert.ed.2, 10:200 (ref.Chemnitz, *op.cit.*, figs. 1808,1809 and Kiener, pl.21, fig.80) [Mediterranean].
1883. *Nassa limata* var. *paucicostata* del Prête, Bull.Soc.Malac.Ital., N.S. 9:260 (Sciasca, Italy) [non Marrat, 1877].
1890. *Nassa robusta* Monterosato, Nat.Sicil. 9:24 (Palermo, Sicily, Italy).
1891. *? Nassa praelonga* Monterosato, Bull.Soc.Sci.Nat.Palermo, No.11:4 (Ficarazzi, Sicily, Pleistocene of Italy).

This species is the *"limata* Chemnitz" and of authors, and the first applicable name for this species is *Nassarius lima* (Dillwyn, 1817). Many authors have compared this species to *N.clathratus* (Born, 1778) and *N.prysmaticus* (Brocchi, 1814), and further study into their relationships is indicated. The Indian Ocean localities so frequently cited for this species are erroneous, and the species lives in the Mediterranean and the Atlantic.

N.miga (Bruguière, 1789)

1789. *Buccinum miga* Bruguière, Encycl.Meth.vers 1:274 (ref.Seba, 3:148, pl.53, fig.43; Adanson, p.116, pl.8, fig.10 and Chemnitz 4:43, pl.124, figs.1167-1169) [Cape Bernard, Goree I, W.Africa].

This species is the type-species of *Uzita* H. & A.Adams, 1853.

N.muelleri (v.Maltzan, 1884)

1884. *Nassa muelleri* v.Maltzan, Nachr.deut.Malak.Gesell. 16(5):69 (Gorée, W.Africa, 20-25 m).

Knudsen (1956) reported the species to be ovoviviparous.

N.mutabilis (Linnaeus, 1758)

1758. *Buccinum mutabile* Linnaeus, Syst.Nat.ed.10:738 (Mediterranean).

The following taxa are synonyms: *Buccinum gibbum* Bruguière, 1789; *B.foliorum* Gmelin, 1791; *B.tessulatum* Gmelin, 1791; *B.jaspideum* Link, 1807; *Buccinum foliosum* Wood, 1818; *B.inflatum* Lamarck, 1822 (non Shaw, 1811); *Nassa mediterranea* Risso, 1826; *Buccinum rufulum* Kiener, 1834; *Nassa gibba* M.E.Gray, 1850; *N.ebenacea* Gennari, 1866; *N.minor* Monterosato, 1878 (non Marrat, 1877); *N.companyoi* Fontannes, 1882; *Sphaeronassa globulina* Locard, 1886; *S.irregularis* Locard, 1892; *N.minuscula* Pallary, 1900; *N.procera* Pallary, 1906 (non Meyer, 1873); *N.propria* Monterosato, 1911; *N.helvetica* Peyrot, 1925; *Sphaeronassa adriatica* Coën, 1933; *S.deformis* Coën, 1933 (non *Nassa deformis* S.W.Wood = *Nassarius*); *S.umbilicata* Coën, 1933.

This species is the type-species of *Sphaeronassa* Locard, 1886.

N.cabrierensis ovoideus (Locard, 1886)

1886. *Nassa ovoidea* Locard, Cat.moll.viv.France, pp.142,553; 1886 Locard, Contrib.faune mala.Francaise 10:89, fig.13 (Royan, France).

N.pachychilus (v.Maltzan, 1884)

1884. *Nassa pachychilus* v.Maltzan, Nachr.deut.Malak.Gesell. 16(5):68 (Njaning, W.Africa).

N.pfeifferi (Philippi, 1844)

1844. *Buccinum pfeifferi* Philippi, Zeit.f.Malakozool. 1:111 (Cadiz, Spain).

The species is very similar to *N.mutabilis* (Linnaeus).

N.plicatellus (A.Adams, 1852)

1852. *Nassa plicatella* A.Adams, Proc.Zool.Soc.Lond. p.111 (Walfish Bay, S.W.Africa).
1852. *Nassa nivea* A.Adams, *ibid.*, p.110 (Batangas, Island of Luzon, 38 m = error).
1923. *Nassa angolensis* Odhner, Goteborg Vet.Handl. 26(4):14, pl.1, figs.6,7 (Angola, W.Africa).
1959. *Nassa scopularcus* Barnard, Ann.Sth.African Mus. 45(1):120, textfig.24a (Sth.of Bogenfels, Late Tertiary of S.W.Africa).

This species also lives in South Africa.

N.prysmaticus (Brocchi, 1814)

1814. *Buccinum prysmaticum* Brocchi, Conch.foss.Subapp. 2:337, pl.5,fig.7 (Pliocene of Italy).
— *Nassarius prismaticus* auct. [invalid emendation — art.32(a)(ii)].

Some authors have considered *N.lima* (Dillwyn, 1817) to be conspecific with *N.prysmaticus* (Brocchi). Adam & Glibert (1976) report the species from the Adriatic Sea, and while acknowledging the extreme similarity of the two species, separate them on superficial and highly variable characters such as more numerous whorls, stronger nodules and plications, and more prominent sutures.

N.pumilio (E.A.Smith, 1872)

1872. *Nassa pumilio* E.A.Smith, Proc.Zool.Soc.Lond. for 1871:732, pl.75, fig.11 (Whydah, W.Africa).
1877. *Nassa minor* Marrat, Prop.forms gen.*Nassa* p.14 (Kabenda, W.Africa) [non Jeffreys, 1867].
1883. *Nassa weyersi* Craven, Ann.Soc.malac.Belg. 17:16, pl.2, fig.2 (Landana, mouth of the Congo, W.Africa).
1923. *Nassa (Hima) polignaci* Lamy, C.R.Congr.Soc.Sav.Paris for 1922:33, textfig. (Portuguese Guinea, W.Africa).
1956. *Nassa madseni* Knudsen, Atlantide Rept. No.4:51, pl.1, fig.6 (Lagos, Nigeria, W.Africa).

N.pygmaeus (Lamarck, 1822)

1822. *Ranella pygmaea* Lamarck, Hist.nat.anim.s.vert. 7:154 (coasts of Le Havre, France).
1825. *Tritonia varicosa* Turton, Zool. J. 2(7):365, pl.13, fig.7.
1826. *Buccinum tritonium* Blainville, Faune Franc.Malac. p.180, pl.7, fig.5.
1882. *Nassa (Tritonella) pygmaea* var. *elongata* Bucquoy, Dautzenberg & Dollfus, Moll.Mar.Rousillon, 1:49, pl.11, fig.14 (non Marrat, 1874).
1882. *Nassa (Tritonella) pygmaea* var. *evaricosa* Bucquoy, Dautzenberg & Dollfus, *ibid.*, 1:49 (Mediterranean).
1886. *Nassa elongatula* Locard, Cat.Moll.viv.France, pp.139,551; 1887 Locard, Contrib.faune malac.Franc. 10:63 (Royan; Martigues, France).
1974. *Hinia (Tritonella) varicosa paucicostata* Nordsieck, Argamon 4(2-4):60, fig.d (Shiqmona, Mediterranean coast of Israel) [non *Nassa paucicostata* Marrat, 1877, nec del Prête, 1883; nec Sacco, 1890 = *Nassarius*].

The species is closely similar to *N.incrassatus* (Stroëm). Martens (1886) considered them to be conspecific.

N.macrodon recidivus (v.Martens, 1876)

1876. *Nassa semistriata* var. *recidiva* v.Martens, Jahrb.deut.Malak.Gesell. 3:246, pl.9, fig.10 (near Cape Verde Is).

1878. *Nassa semistriata* var. *bulliaeformis* Kobelt, Icon.europ.Meeresconch. 1:133, pl.23, fig.24 (Mediterranean).

1889. *Nassa semistriata* var. *azorica* Dautzenberg, Result.Camp.Hirondelle, p.34, pl.2, figs.9a-c (Fayal, Azores, 400-500 m).

1890. *Nassa glomus* Monterosato, Nat.Sic.Conch.prof.Palermo 9:24 (Sardeigne, Mediterranean).

1897. *Nassa antiquata* Watson, J.Linn.Soc.Lond. 26:241, pl.19, fig.10 (Funchal and Gabo Girão, Madeira) [non Gabb, 1864].

1900. *Nassa (Telasco) azorica fuscoviolacea* Pallary, J.Conchyl. 48:274 (Oran, Algeria).

N.reticulatus (Linnaeus, 1758)

1758. *Buccinum reticulatum* Linnaeus, Syst.Nat.ed.10:740 (ref. Gualtieri,pl.44, figs.G,C,E) [Mediterranean Sea].

The following taxa are synonyms: *Buccinum vulgatum* Gmelin, 1791; *B.nassula* v.Salis, 1793; *B.anglicum* Roeding, 1798; *B.chrysostomum* Roeding, 1798; *B.porcatum* Roeding, 1798 (non Gmelin, 1791); *B.hepaticum* Montagu, 1803; *B.marginulatum* Lamarck, 1822; *Planaxis mammillata* Risso, 1826; *Nassa cancellata* Moerch, 1852 (non Lea, 1833); *N.oblonga* Moerch, 1852 (non *Buccinum oblongum* Sassi, 1827 = *Nassarius*); *N.nitida* Jeffreys, 1867; *N.cancellata* v.Martens, 1870 (non Lea, 1833); *N.limicola* v.Martens, 1870 (non *Buccinum limicola* Philippi, 1851 = *Nassarius*); *N.pontica* Kobelt, 1878; *N.aegyptiaca* P.Fischer in Vassel, 1880; *N.curta* Bucquoy, Dautzenberg & Dollfus, 1882 (non Gould, 1850); *N.depicta* Bucquoy, Dautzenberg & Dollfus, 1882; *N.rosea* Bucquoy, Dautzenberg & Dollfus, 1882; *N.coronata* Nobre, 1884 (non *Buccinum coronatum* Bruguière, 1789 = *Nassarius*); *N.isomera* Locard, 1886; *N.bourguignati* Locard, 1887; *N.poirieri* Locard, 1887; *N.minor* Marshall, 1893 (non Jeffreys, 1867); *N.mediterranea* Milaschewitsch, 1909 (non Risso, 1826); *N.modesta* Milaschewitsch, 1909; *N.gratiosa* Monterosato, 1912; *N.lacunaris* Monterosato, 1912; *N.propria* Monterosato, 1912; *N.syracusana* Monterosato, 1912; *N.tenuisculpta* Monterosato, 1912; *N.tiesenhauseni* Monterosato, 1912; *N.tricolor* Monterosato, 1912; *N.valentina* Monterosato, 1912; *N.abnormis* Coën, 1914; *N.viriditincta* Dautzenberg & Fischer, 1926; *N.acutior* Coën, 1933; *N.bicolorata* Coën, 1933; *N.clodiensis* Coën, 1933; *N.deformis* Coën, 1933; *N.monilifera* Coën, 1933.

The species is the type-species of *Hinia* Gray, 1847. Spawns have been described by Lebour (1931), Thorsson (1946) and Gomoiu (1964).

N.sanctaehelenae (A.Adams, 1852).

1852. *Nassa sanctaehelenae* A.Adams, Proc.Zool.Soc.Lond. p.110 (St. Helena, 37 m).

N.sesarma (Marrat, 1877)

1877. *Nassa sesarma* Marrat, Prop.new forms gen.*Nassa* p.13, pl.1, fig.14 (Whydah, Dahomey, W.Africa).

1884. *Nassa heynemanni* v.Maltzen, Nachrichts.deut.Malak.Gesell. 16(5):70 (off Goree, Senegal, W.Africa).

N.skoogi (Odhner, 1923) (Fig. 102)

1923. *Adinopsis skoogi* Odhner, Goteborg Kungl.Vet.Handl. 26(7):15, pl.1, fig.11 (shell), fig.13 (operculum), fig.14 (radula) [Port Alexander, Angola, W.Africa, 29 m).

This species is the type-species of *Adinopsis* Odhner, 1923 (non Cameron, 1918).

N.tinei (Maravigna, 1840)

1840. *Buccinum tinei* Maravigna in Guerin, Magasin de Zoologie, (2), 2:pl.24 (Messina, Italy).

1845. *Buccinum gussonii* Calcara, Cenne Moll.Siciliae p.41, pl.4, fig.24 (Palermo, Italy).

The status of this species is uncertain. Some authors place it in the synonymy of *N.corniculus* (Olivi, 1792), others in the synonymy of *N.semistriatus* (Brocchi, 1814). *N.tinei* is the type-species of *Gussonea* Monterosato, 1912, a genus which has chronological priority over *Amyclina* Iredale, 1918.

N.tingitanus (Pallary, 1901)

1901. *Nassa tingitana* Pallary, J.Conchyl. 49:226; 1902 Pallary, J.Conchyl. 50:10, pl.1, figs.3,4 (Tangier, Morocco).

This species is the type-species of *Hannonia* Pallary, 1914, which is a primary homonym of *Hannonia* Hoek, 1881. *N.tingitanus* would be appropriately placed in the subgenus *Aciculina* A.Adams, 1853.

N.tritoniformis (Kiener, 1841)

1841. *Buccinum tritoniformis* Kiener, Spéc.gen.icon.coq.viv. 9:108, pl.30, fig. 2 (Senegal, W.Africa).

N.turbineus (Gould, 1845)

1845. *Nassa turbinea* Gould, Proc.Boston Soc.Nat.Hist. 2:37; 1845 Gould, Boston J.Nat.Hist. 5:292, pl.24, fig.10 (Liberia, W.Africa).

1850. *Buccinum (nassa) webbei* Petit de la Saussaye, J.Conchyl. 1:404, pl.13, fig.8 (coasts of West Africa).

N.turulosus (Risso, 1826)

1826. *Planaxis turulosus* Risso, Hist.nat.l'Europe merid. 4:174, pl.8, fig.108 (Mediterranean).

1882. *Nassa edwardsi* P.Fischer, J.Conchyl. 30:50 (southern coast of France, 680 - 2660 m).

The species is similar to the fossil *N.semistriatus* (Brocchi, 1814).

N. vinctus (Marrat, 1877)

1877. *Nassa vincta* Marrat, Prop.new forms gen.*Nassa* p.12 (No locality).

1853. *Nassa trifasciata* A.Adams, Proc.Zool.Soc.Lond. p.113 (Vigo Bay = error) [non *Buccinum trifasciatum* Gmelin, 1791; nec *Planaxis trifasciata* Risso, 1826 = *Nassarius*].

1903. *Nassa analogica* Sowerby, Mar.Invest.Sth.Africa 2:219, pl.4, fig.3 (Cape Infanta, Sth.Africa, 73 m).

1903. *Nassa (Amycla) circumtexta* v.Martens, Besch.Gast.deut.Tief.Exped. "Valdivia" p.27, pl.3, fig.18 (betw.Plettenberg Bay and Francis Bay, 100 m).

1932. *Nassa aenigmatica* Turton, Mar.shells Pt.Alfred p.58, pl.13, fig.431 (Pt.Alfred, Sth.Africa).

The species also lives in South Africa.

N. wolffi (Knudsen, 1956)

1956. *Nassa wolffi* Knudsen, Atlantide Rept. No.4:58, pl.1, fig.7 (West Africa).

The species is very similar to *N. frigens* (v.Martens, 1878).

Demoulia obtusata (Link, 1807)

1807. *Buccinum obtusatum* Link, Beschr.Nat.-Samml.Univ.Rostock, p.126 (ref. Chemnitz, 10:pl.153, fig.1466) [No locality].

For a detailed synonymy see under *Demoulia* in the Indo-Pacific section.

Cyclope neritea (Linnaeus, 1758)

1758. *Buccinum neriteum* Linnaeus, Syst.Nat. ed.10:738 (ref.Gualtieri, pl.65, figs.C,I (Mediterranean Sea).

The following taxa are synonyms: *Cyclops asterizans* Montfort, 1810; *Nassa neritoides* Lamarck, 1816; *Cyclope donovania* Risso, 1826; *C. neritoidea* Risso, 1826; *Nanina unifasciata* Risso, 1826 (spec.juv.); *Nassa albida* Requien, 1848; *N. lutescens* Requien, 1848; *N. major* Requien, 1848 (non Grateloup, 1847); *N. media* Requien, 1848 (non *Buccinum media* Philippi, 1836 = *Nassarius*); *N. minima* Requien, 1848; *Cyclops kamiesch* Chenu, 1859; *Nassa minor* Weinkauff, 1868 (non Grateloup, 1847); *N. italica* Issel, 1869 (spec.juv.); *Cyclonassa unifasciata* Paulucci, 1871; *Nassa inflata* Locard & Caziot, 1900 (non *Eione inflata* = *Cyclope*); *Neritula mucronata* Locard, 1887; *Nassa vayssierei* Pallary, 1903; *N. callosa* Pallary, 1912 (non A.Adams, 1852); The following varietal names date from Pallary, 1919: *communis; compacta; depressa; discoidea; elongata; gibba; globulosa; kamieschensis; lactescens; platystoma; Cyclonassa carinata* Coën, 1933; *C. diluta* Coën, 1937; *C. fasciata* Coën, 1933; *C. vernicata* Coën, 1933; *Cyclope tarentina* Parenzan, 1970.

The species is the type-species of *Cyclope* Risso, 1826. The species has also been reported from the Suez Canal by Barash & Danin (1972).

Cyclope pellucidus Risso, 1826.

1826. *Cyclope pellucidus* Risso, Hist.nat.l'Europ.merid. 4:272 (Mediterranean).

1840. *Panormella lofasi* da Costa, Fauna Sicil. p.2 (Mediterranean).

C. westerlundi Brusina, 1900.

1900. *Cyclope westerlundi* Brusina, Nachr.deut.Malak.Gesell. p.89 (brackish water, Greece).

This species is the type-species of *Proneritula* Thiele, 1929.

DUBIOUS SPECIES AND EXCLUDED SPECIES OF NASSARIINAE FROM EUROPE AND THE EAST ATLANTIC

Nassa aethiopica Marrat, 1873.

1873. *Nassa aethiopica* Marrat, Ann.Mag.Nat.Hist. (4), 12:426 (Kabenda, 30 miles (48 km) Nth. of the Congo. W.Africa, 18 m).

Tomlin (1940) considered *Nassarius aethiopicus* to be a prior name for *N. argenteus* (Marrat, 1877), a conclusion with which Adam (1976) disagreed. For further discussion of this species see Adam (*op.cit.*).

Amyclina compacta Nordsieck, 1968.

1968. *Amyclina compacta* Norsieck, Europ.Meeres-Gehäuseschnecken 1:140, pl.23,fig.80-45 (Portovenere, Liguria, Italy) [non *Nassa compacta* Angas, 1865; nec Fontannes, 1879 = *Nassarius*].

This species is unrecognisable from the short description and indifferent figure. The taxon is twice pre-occupied by *Nassa compacta* Angas, 1865, which is a synonym of *Nassarius (Hima) pauperus* (Gould), and by *Nassa compacta* Fontannes, 1879, a species which is consubgeneric with *compacta* Nordsieck, and is synonymous with *Nassarius pyrenaicus* (Fontannes, 1879).

Nassa vaucheri Pallary, 1914.

1914. *Nassa (Hima) vaucheri* Pallary, Expl.Sci.Maroc.Miss.zool.Malac. 2:35 (Rabat, Morocco).

The examined syntype of *"Nassa vaucheri"* belongs to the genus *Chauvetia* Monterosato, in the family Buccinidae. For further discussion see Cernohorsky (1975a).

Nassa vitrea Gray, 1838.

1838. *Nassa vitrea* Gray, Ann.Mag.Nat.Hist. 1(1):28 (Sierra Leone, W.Africa).

The species was only briefly described and the type is lost. The species remains unidentified.

CHECK-LIST OF RECENT AND FOSSIL SPECIES OF NASSARIIDAE FROM THE AUSTRAL – NEOZELANIC REGION

Species from this faunal province have recently been monographed by Cernohorsky (1981a).

Nassarius (Alectrion) aoteanus Finlay, 1927

1927. *Nassarius aoteanus* Finlay, Trans.Proc.N.Z.Inst. 57:419 (Near North Cape, New Zealand, 20-37 m) [nom.subst.pro *Arcularia coronata* E.A. Smith, 1915].

N. (A.) spiratus (A.Adams, 1852)

1852. *Nassa spirata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:106 (Swan River, Australia = error; Long reef, Collaroy, N.S.W., Australia, designated by Cernohorsky, 1981a).

N. (A.) glans particeps (Hedley, 1915)

1913. *Alectrion suturalis* subsp. *dunkeri* Suter, Man.N.Z.Moll. p.398; 1915 Suter, *ibid.* Atlas, pl.45, fig.17 (non Suter, 1908).

1915. *Arcularia particeps* Hedley, Proc.Linn.Soc.N.S.W. 39:738 (Sydney, N.S.W., Australia).

Nassarius (Plicarcularia) burchardi (Dunker in Philippi, 1849)

1849. *Buccinum burchardi* Dunker in Philippi, Abb.Beschr.Conchyl. 3:69, pl.2, fig.14 (Adelaide, Sth. Australia).

1852. *Nassa labecula* A.Adams, Proc.Zool.Soc.Lond. p.98 (Burias I, Philippines, 11 m = error).

1936. *Parcanassa ellana* Iredale, Rec.Austral.Mus. 19:322 ("Stradbroke I" on label accompanying syntypes).

N. (P.) jonasii (Dunker, 1846)

1846. *Buccinum jonasii* Dunker, Zeit.f.Malakozool. 3:171 (No locality).

1852. *Nassa cancellata* A.Adams, Proc.Zool.Soc.Lond. p.99 (Masbate, Philippines = error) [non Lea, 1833].

1853. *Nassa mangelioides* Reeve, Conch.Icon. 8:pl.23,figs.152a,b (No locality).

1956. *Austronassaria simplex* C. & J.Laseron, Proc.R.Zool.Soc.N.S.W. for 1855:71, textfigs.1,2 (Sow & Pigs reef, Port Jackson, N.S.W., Australia, 11-16 m) [non *Nassa simplex* S.V.Wood, 1872; nec Seguenza, 1880].

Nassarius (Niotha) pauperatus (Lamarck, 1822)

1822. *Buccinum pauperatum* Lamarck, Hist.nat.anim.s.vert. 7:278 (No locality).

1843. *Buccinum australe* Menke, Moll.Novae Hollandiae p.21 (New Holland = Australia) [non Gmelin, 1791].

1853. *Nassa lirella* "Beck MS", Reeve, Conch.Icon. 8:pl.14, fig.95 (No locality).

N. (N.) nigellus (Reeve, 1854)

1846. *Buccinum semigranosum* Dunker, Zeit.f.Malakozool. 3:170 (No locality) [non Wood, 1828].

1854. *Nassa nigella* Reeve, Conch.Icon. 8:pl.26, figs.173a,b (New Zealand = error; Sydney Harbour, N.S.W., Australia, designated by Cernohorsky, 1981).

1860. *Nassa optata* Gould, Proc.Boston Soc.Nat.Hist. 7:331 (Sydney Harbour, N.S.W., Australia).

1864. *Nassa munieriana* Crosse, J.Conchyl. 12:345, pl.13, fig.6 (Gulf of St.Vincent, Sth. Australia).

1876. *Nassa tasmanica* Tenison-Woods, Proc.R.Soc.Tasmania 39:737, pl.84, fig.81 (North Tasmania).

1880. *Nassa peritrema* Tenison-Woods, Proc.Linn.Soc.N.S.W. 4:21, pl.4, figs.5,5a (Sow & Pigs reef, Port Jackson, N.S.W., Australia).

N. (N.) sublirellus (Tate, 1888)

1888. *Nasa (sic) sublirella* Tate, Trans.R.Soc.Sth.Australia 10:171 (Upper beds at Muddy Creek, Pliocene of Victoria, Australia).

N. (N.) crassigranosus (Tate, 1888)

1888. *Nassa crassigranosa* Tate, Trans.R.Soc.Sth. Australia 10:170, pl.12, figs.6a,b (Upper beds at Muddy Creek, Pliocene of Victoria, Australia).

N. (N.) nuttalli (Ludbrook, 1978)

1978. *Tavaniotha nigella nuttalli* Ludbrook, Geol.Surv.W.Australia Bull. 125:152, pl.20, figs.33,34 (St.4434-FL8, 61 km E.of Madura, W.Eucla Basin, 31°53'47" S & 127°35'E, Roe Calcarenite, Early Pleistocene, S.W. Australia).

Nassarius (Zeuxis) dorsatus (Roeding, 1798)

1791. *Buccinum trifasciatum* Gmelin, Syst.Nat.ed.13:3489 (No locality) [non Gmelin, 1791, p.3477].

1798. *Buccinum dorsatum* Roeding, Mus.Bolten. p.111 (No locality; Port Darwin, Northern Territory, Australia, designated by Cernohorsky, 1981).

1827. *Nassa livida* Gray in King, Narrat.Surv.Australia 2: App.p.484 (Australia).

1830. *Buccinum nitidulum* Cuvier, Le Regne Animal ed.2, 3:98 (No locality) [non Linnaeus, 1758].
1834. *Buccinum unicolorum* Kiener, Spéc.gen.icon.coq.viv. 9:60.pl.19, fig.69 (No locality).
1852. *Nassa laevis* Moerch, Cat.Conchyl.Yoldi 1:77 (No locality) [non Fischer v. Waldheim, 1807].
1853. *Nassa unicolorata* Reeve, Conch.Icon. 8:pl.3,fig.17 (North Australia).
1853. *Nassa rutilans* Reeve, *ibid.* 8:pl.22,fig.147 (New Zealand = error).
1906. *Bullia cinerea* Preston, Proc.Malac.Soc.Lond. 7:34, textfig. (? Ceylon = error).

N. (Z.) pyrrhus (Menke, 1843)
1822. *Buccinum fasciatum* Lamarck, Hist.nat.anim.s.vert. 7:211 (New Holland = Australia) [non Mueller, 1774].
1843. *Buccinum pyrrhum* Menke, Moll.Novae Hollandiae p.21 (nom.subst.pro *B.fasciatum* Lamarck, 1822).
1853. *Nassa (Tritia) dealbata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:112 (Damaguete, Negros I, Philippines = error).
1915. *Alectrion victorianus* Iredale, Trans.Proc.N.Z.Inst. 47:467 (nom.subst. pro *Buccinum fasciatum* Lamarck, 1822).

N. (Z.) subcopiosus (Ludbrook, 1958)
1958. *Hinia (Reticunassa) subcopiosa* Ludbrooke Trans.R.Soc.Sth.Australia 81:64,pl.3, fig.1 (Hindmarsh Bore, Dry Creek Sands, 137-148 m, Lower Pliocene of South Australia).

N. (Z.) spiraliscabrus (Chapman & Gabriel, 1914)
1914. *Nassa spiraliscabra* Chapman & Gabriel, Proc.R.Soc.Victoria,N.S. 26(2):325, pl.28, fig.34 (Mallee Bore No.8, 199-209 feet [61-64 m], Pliocene of Victoria, Australia).

N. (Z.) fraudator Cernohorsky, 1980.
1980. *Nassarius (Zeuxis) fraudator* Cernohorsky, Rec.Auckland Inst.Mus. 17:141, figs.12-15 (shell), fig.16 (radula), fig.17 (operculum) [Somerset Bay, Cape York Peninsula, Nth. Queensland, Australia].

Nassarius (Gussonea) wilsoni (Ludbrook, 1978) [nom. praeocc.]
1978. *Amyclina wilsoni* Ludbrook, Geol.Surv.W.Australia Bull. 125:150, pl.17, figs.3,4 (St.4434-FL6, Hampton Microwave Repeater Tower, 31°57'57"S & 127°34'45"E, Roe Calcarenite, Eucla Basin, E.Pleistocene of S.W. Australia) [non *Nassa wilsoni* C.B.Adams, 1852 = *Nassarius*].

Nassarius (Hima) tatei tatei (Tenison-Woods, 1879)
1879. *Nassa tatei* Tenison-Woods, Proc.Linn.Soc.N.S.W. 3:230, pl.21, fig.13 (Lower beds at Muddy Creek, Victoria, Middle Miocene of Australia).

N. (H.) tatei socialis (Hutton, 1886)
1877. *Nassa (Uzita) compta* Hutton, Trans.Proc.N.Z.Inst. 9:596, pl.16, fig.9 (White Rock River, Canterbury, Lower Miocene of New Zealand) [non A.Adams, 1852].
1886. *Nassa socialis* Hutton, Trans.Proc.N.Z.Inst. 18:333 (nom.subst.pro *N.compta* Hutton, 1877).
1939. *Hima (Mirua) separabilis* Laws, Trans.Proc.R.Soc.N.Z. 68:496, pl.65, fig.52 (Pakaurangi Pt., Kaipara Harbour, Lower Miocene of New Zealand).

N. (H.) mobilis (Hedley & May, 1908).
1908. *Arcularia mobilis* Hedley & May, Rec.Austral.Mus. 7:121,pl.23, fig.16 (11 km E.of Cape Pillar, Tasmania, Australia, 183 m).
1908. *Arcularia mobilis* var. *costata* Hedley & May, *ibid.* 7:121, pl.23, fig.17 (11 km E. of Cape Pillar, Tasmania, Australia, 183 m) [non S.V.Wood, 1848; nec A.Adams, 1852].
1932. *Nassarius verconis* Cotton & Godfrey, Sth. Austral.Nat. 13:94,pl.1, fig.7 (Beachport, Sth. Australia, 275 m).
1936. *Reticunassa mobilis plankta* Iredale, Rec.Austral.Mus. 19:322 (Newcastle Heads, New South Wales, 73 m).
1962. *Reticunassa compacta benthalis* Gabriel, Mem.Nat.Mus.Victoria No.25:189, textfig.1 (off Cape Everard, Sth. Australia, 119 m).

Nassarius (Cryptonassarius) ephamillus (Watson, 1882)
1882. *Nassa ephamilla* Watson, J.Linn.Soc.Lond. 16:370 (E. of East Cape, 37°34'S & 179°22'E, 1281 m).
1886. *Nassa dissimilis* Watson, Rept.Sci.Res.Voy.H.M.S. "Challenger", Zool. 15:175,pl.17,fig.6 (off New Zealand, 40°28'S & 177°43'E, 2013 m).
1907. *Arcularia dipsacoides* Hedley, Rec.Austral.Mus. 6(5):359, pl.67, fig.21 (56 km E.of Sydney, New South Wales, Australia, 1464 m).
1938. *Reticunassa flindersi* Cotton & Godfrey, Rec.Austral.Mus. 6(2):204, pl.17, fig.8 (Cape Jaffa, South Australia, 549 m).

INDO-PACIFIC SPECIES OF NASSARIINAE

Genus **Nassarius** (Duméril, 1806)

Nassarius Duméril, 1806, Zool. Analytique p.166. Type species by SM (Froriep, 1806) *Buccinum arcularia* Linnaeus, 1758. Recent, Indo-Pacific.

1799. *Nassa* Lamarck, Mem.Soc.Hist.Nat.Paris p.71. Type species by M *Buccinum mutabile* Linnaeus, 1758. Recent, Mediterranean Sea. (Non *Nassa* Roeding, 1798).
1807. *Arcularia* Link, Beschr.Nat.-Samml.Univ. Rostock p.126. Type species by SD (Moerch, 1863) *A.coronata* Link, 1807 (non Bruguiére, 1789) = *Buccinum arcularia* Linnaeus, 1758.
1828. *Nasa* Fleming, Hist.Nat.Brit. Anim. p.340 (invalid emendation).
1888. *Arculia* Jousseaume, Mem.Soc.Zool.France 1:184 (invalid emendation — cited twice and included *arcularia* and *deshayesianus*).

Shell moderately large for the family, whorls convex and usually angulate, sculptured with axial ribs and occasionally spiral threads and nodes at the body whorl suture, columella calloused and greatly or moderately expanded laterally, anterior of columella denticulate; outer lip dentate, aperture strongly plicate, anal and siphonal canals very prominent. Operculum corneous, usually serrate at the marging and brown in colour.

Radula with multicuspid rachidians, laterals consisting of 2 single cusps, accessory lateral plate present.

GEOGRAPHICAL DISTRIBUTION. Tropical Indo-Pacific.

STRATIGRAPHICAL RANGE. Pliocene to Recent.

Only 3 species have been retained in the subgenus *Nassarius*.

Nassarius arcularia arcularia (Linnaeus, 1758)
(Plate 1, figs. 1-3)

1758. *Buccinum arcularia* Linnaeus, Syst.Nat. ed.10:737 (ref. Rumphius, Mus. pl.27, fig.M etc.); 1825 Wood, Ind.Test. p.106,pl.22,fig.40; 1833 Quoy & Gaimard, Voy.l'Astrolabe 2:438,pl.32,figs,1-4 (animal); 1834 Kiener, Spéc.gen.icon.coq.viv. 9:94,pl.28,fig.115; 1956 Dodge, Bull.Americ.Mus.Nat.Hist. 111:190.
1773. *"Galeodes Arcularia major"* Martini, Syst.Conch.-Cab. 2:89,pl.41,figs.409,410 (non binom.).
1798. *Distorsio arcularia* Roeding, Mus.Bolten.p.133 (ref.Marini, *op.cit.*, figs.409,410).
1807. *Arcularia coronata* Link *(pars)*, Beschr.Nat.-Samml.Univ.Rostock, 3te Abth. p.126 (ref.Martini, figs.409-412) [non *Buccinum coronatum* Bruguiére, 1789 = *Nassarius*].
1816. *Nassa arcularia* Lamarck, Tabl.Encycl.Méth. p.1,pl.394, figs.1a,b; 1842 Reeve, Conch.Syst. 2:236, pl.169,fig.1; 1853 Reeve, Conch.Icon. 8:pl.4,figs.25a,b; 1864 Crosse & Fischer, J.Conchyl. 12:333; 1889 Sowerby, J.Conch. 6:148; 1895 Melvill & Standen, J.Conch. 8:107; 1877 Brazier, Proc.Linn.Soc.N.S.W. 1:178; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:409; 1904 Jones & Preston, Proc.Malac.Soc.Lond. 6:143; 1911 Schepman, Siboga Exped. 49d:311; 1927 Fischer in Wanner, Palaeont.Timor,Lief.15:70; 1955 Marche-Marchad, J.Conchyl. 95:31; 1959 Barnard, Ann.Sth.Afric.Mus. 45:113,fig.22i (radula).
1852. *Nassa (Arcularia) scalariformis* Moerch, Cat.Conchyl.Yoldi, fasc.1:79 (ref.Chemnitz, vol.4, figs,1174,1175 — spec.juv.) [non *Buccinum scalariforme* Kiener, 1834 = *Nassarius*].
1854. *Buccinum rumphii* Deshayes, Rousseau, Voy.Pole Sud.Moll. 5:75,pl.21,figs.9,10 (non Deshayes & Edwards, 1844).
1931. *Nassarius (Nassarius) arcularia* Linne, Oostingh, Arch.Moll. 63:208.
1938. *Nassa (Nassa) arcularia* Linne, Adam & Leloup, Mem.Mus.R.d'Hist.Nat.Belg, 2:183,pl.8,figs.7a,b (spec.juv.).
1942. *Nassarius arcularia* (Linne), Yen, Proc.Malac.Soc.Lond. 24:231.
1955. *Nassarius arcularius* (Linne), Cotton, R.Soc.Sth.Austral.Malac.Sect. No.7:2, fig.15; 1957 Kaicher, Indo-Pacif.Sea shells pl.7,fig,11; 1961 Habe, Col.Illust.shells Japan 2:65,pl.32,fig,27; 1971 Wilson & Gillett, Austral.shells p.102,pl.66,figs.1,la.
1966. *Nassarius pullus* Habe & Kosuge, Shells world col.2:62,pl.22,figs,33,34 (non *Buccinum pullus* Linnaeus, 1758).
1969. *Nassarius (Nassarius) arcularius* (Linne), Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol.19:129,pl.12,fig.13; pl.14,figs.12-14.
1972. *Nassarius arcularius arcularius* (Linnaeus), Cernohorsky, Rec.Auckland Inst.Mus. 9:128,figs.2,5 (shell),fig.1 (opercula), fig.19 (radula).

Shell to 40.0 mm in length, teleoconch of 6-7 whorls, protoconch of 2¾-3½ obsoletely carinate embryonic whorls; sculptured with strong axial ribs which frequently become nodose at the body whorl suture; interspaces smooth in Pacific populations but with 2-3 weak or very strong spiral grooves on penultimate whorl in Western Indian Ocean populations. Apertural callus either large and prominent and sometimes extending to the penultimate whorl, or smaller and not quite reaching body whorl suture, anal and siphonal canals prominent, aperture strongly lirate, parietal denticle prominent, base

of columella with up to 6 denticles, base of shell with 4-6 close-set spiral ridges, fasciolar cord prominent. Cream, grey or brown in colour, sometimes with darker bands or dark brown spots between body whorl nodes, apertural callus porcellaneous-white. Operculum brown, variously serrate at margin.

TYPE LOCALITY. Unknown *(arcularia* and *scalariformis)*; Timor, Indonesia, is here designated as the type locality.

DISTRIBUTION. From Sri Lanka to the Cocos-Keeling Is, Ryukyu and Tonga Islands. In clean and muddy sand, intertidal to 8 m.

Type specimens. An adult specimen of *N.arcularia* (Linnaeus), is in the Linnean Society collection, London, length 28.1 mm, width 18.1 mm; this specimen has the "Systema Naturae ed.12" number, and it is the typical smooth form of the species. The type-specimen of *scalariformis* Moerch, based on a juvenile specimen, is no longer extant.

Material examined. SRI LANKA: (AIM; USNM); Back Bay, Trincomalee (ZMC); ANDAMAN IS.: (ZSI); NICOBAR IS.: Galathea Bay, Gt.Nicobar I, 8 m (ZMC); INDONESIA: Sibuan I, Borneo; Domaring, Borneo; Pulau Stupai, Sumatra; Mentawai Is.; Soemoer, Bantam, Java; Tomahu I, Moluccas; Gamoms I, Celebes; Tagnak I, Borneo (all USNM); Lontor, Banda I; Doe Roa, Kei-Oerne, Kai Is (both ZMC); Daeo, S.coast of Morotai, Malaka; Pantai Kelapa Lima, N.of Kupang, Timor; Sunur Beach, Bali (all coll.McCausland); Morotai I,; N.of mouth of Mahakane river, E.Borneo (both AMS); PHILIPPINES: St.Cruiz I, Zamboanga; Baler, E.coast of Luzon (both ZMC); Guijulugan, Negros; Punta Princessa, Palawan; Cuyo I, Calamianes; off Basilan; Lemery, Luzon; Aindangan, Mindanao; Tagbayak Bay, Palawan; Tataan, Tawi Tawi group; Port Ciego, Balabac (all USNM); HONG KONG: (BMNH); RYUKYU IS.: (USNM); WEST IRIAN: Sowek, Soepiori, Schouten I (AIM); Biak (AMS); PAPUA NEW GUINEA: Manus I (ZMC); Palikau village, Mussan I, New Ireland; Rabarua, E.New Britain (both coll.Parkinson); Mongop, near Kavieng, New Ireland; Madang; Duke of York I, New Britain (all AMS); SOLOMON IS.: Gihili, Bougainville; Reef I, Santa Cruz group (both AMS); AUSTRALIA: Green I, Qld. (AIM); Port Curtis (AMS); Nth.Keppel I (coll.Gardner); NEW HEBRIDES: Kakula I, N.Efate I; Tuki Tuki Pt.,Efate I; Port Havannah, Efate I; Pango Pt., Efate I (all AIM); Hog Harbour, Santo I (coll.Taylor); Vila, Efate I; Surunda, Espiritu Santo (both coll.Cole); LOYALTY IS.: (AMS; USNM); NEW CALEDONIA: Bourail (AMS); FIJI IS: Levuka, Ovalau I; Vanua Balavu I; Lakeba I; Moce I; Karoni I, all Lau group (all AIM); Suva Pt.(USNM); Vabia, Ono I; Nadi Bay; Lautoka (all AMS); Nananu-i-Ra I (coll.Eker); Ogea I, Lau group (coll.Northgrove); TONGA IS: Tongatapu I (USNM); Nuku'alofa (ZMC); Haapai (coll.Eker).

Fossil record. PLIOCENE: Akelamo valley, Obi I, Timor, Indonesia (Fischer in Wanner 1927); PLIO-PLEISTOCENE: Panay I, Philippines (Shuto 1969).

When Linnaeus (1758) named the species *Buccinum arcularia*, he obviously had in mind the diminutive of *arcula* which is of feminine gender, rather than *arcularius* (the casket-maker) of masculine gender, and the species should be listed as *Nassarius arcularia* (Linnaeus).

Occasional specimens from Sri Lanka, Nicobar Is, Andaman Is, Indonesia and the Philippines, have a reduced columellar callus which is horizontally truncate and some distance anterior to the body whorl suture (Pl.1,fig.3).

Nassarius arcularia plicatus (Roeding, 1798)
(Plate 1, figs. 4-9)

1773. *"Galeodes Arcularia major"* Martini, Syst.Conch.-Cab. 2:91,pl.41,figs.411,412 (non binom.).
1798. *Distorsio plicata* Roeding, Mus.Bolten. p.133 (ref.Martini, *op.cit*, figs.411,412).
1816. *Nassa arcularia* var. *spira cancellata* Lamarck, Encycl.Meth.Tabl.p.1, pl.394,fig.2.
1834. *Buccinum obvelatum* Deshayes in Laborde & Linant, Voy.l'Arabie & Petree, p.66,figs.5,6.
1834. *Buccinum pullus* Linne, Kiener, Spéc.gen.icon.coq.viv. 9:96,pl.28,fig.114 (non Linnaeus, 1758).
1844. *Buccinum rumphii* Deshayes & Edwards, Hist.nat.anim.s.vert. ed.2, 10:179 (ref.Martini, *op.cit.*,figs.411,412; Lamarck, 1816, pl.394,fig.2) [non *B.rumpfii* Gmelin, 1791].
1852. *Nassa (Arcularia) plicata* Bolten, Moerch, Cat.Conchyl.Yoldi,fasc.1:79.
1852. *Nassa sulcifera* A.Adams, Proc.Zool.Soc.Lond. p.98 (aberrant spec.); 1853 Reeve, Conch.Icon. 8:pl.4,figs.24a,b.
1853. *Nassa pulla* Linn., Reeve, Conch.Icon. 8:pl.4,figs.22a,b (non *Buccinum pullus* Linnaeus, 1758).
1877. *Nassa crispata* Marrat, Prop.new forms genus *Nassa* p.14 (spec.juv.).
1898. *Nassa arcularia* Linn., Melvill & Sykes, Proc.Malac.Soc.Lond. 3:37; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:409; 1929 Dautzenberg, Faune Colon.Franc. 3:407; 1973 Kensley, Sea-shells Sth. Africa p.160,fig,586.
1912. *Nassa pulla* var. *minor* Smith, Nautilus 26:77 (non Marrat, 1877).
1927. *Nassarius arcularia* Linne, Cox, Rept.Pal.Zanzibar Prot. p.8,pl.18,figs.13a,b.
1928. *Nassarius pullus* Linn. Melvill, Proc.Malac.Soc.Lond. 18:106; 1930 Bisacchi, Ann.Mus.Civ.Stor, Nat.Genova 55:47, textfigs.1-3; 1957 Kaicher, Indo-Pacif.seashells pl.7,fig.6; 1961 Spry, Tanganyika Notes & Records No.56:23,pl.7,fig.73.

1930. *Nassarius arcularius* Linn., Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:44.
1938. *Nassa (Nassa) rumphii* Hombron & Jacquinot, Adam & Leloup, Mem.Mus.R.d'Hist.Nat.Belg. 2:184,pl.8,figs,8a,b.
1972. *Nassarius arcularius plicatus* (Roeding), Cernohorsky, Rec.Auckland Inst.Mus. 9:129,figs.3,4 (shell), fig.20 (radula); 1977 Barash & Danin, "Conchiglie", Unione Malac.Ital. 13(5-6):95,fig.10.

Similar in size, form and development of columellar callus to the nominate subspecies *N.arcularia arcularia*, and differs only in the presence of a spiral sculpture consisting of either shallow or moderately deep spiral groves.

TYPE LOCALITY. None *(plicatus* and *rumphii)*; Red Sea *(obvelatum)*; Algoa Bay, Sth. Africa *(sulcifera)*; Philippines = error! *(crispata)*; Aden *(minor)*. The Seychelles Islands are here designated as the type locality.

DISTRIBUTION. From the Red Sea and the Persian Gulf to Mauritius and South Africa. In sand, from the intertidal zone to 24 m.

Type specimens. Roeding's types are either no longer extant or cannot be segregated from the general collection. The specimen illustrated by Martini (1773) on plate 41, in fig.412 (Pl1,fig.4) is here designated as the illustrated lectotype of *N.arcularia plicatus*. The holotype of *Nassa sulcifera* A. Adams, is in the British Museum (N.H.) No 1973125, length 30.1 mm, width 20.2 mm; it is an aberrant individual with prominent spiral cords and a rather small columellar callus. The juvenile holotype of *N.crispata* Marrat, is in the Merseyside County Museum, Liverpool, length 13.0 mm, width 9.0 mm. The whereabouts of the types of *rumphii* Deshayes & Edwards, and *minor* Smith, are unknown, and the type of *obvelatum* Deshayes is lost (Dr.P.Bouchet, *in litt.*).

Material examined. RED SEA: Port Sudan (AIM); Museri I; Dahlak Archipelago, 15°35'N&40°40'E, 20-24 m; Ras A Tantur; Sharm A Sheich; Ras Muhamad; Dahab; Et Tur, Gulf of Suez; Fara'un I, Gulf of Aqaba; Abu Samra (all TAU); 5-8 km S.of Aqaba (coll.Mastaller); N.of Jidda, Arabia; Gulf of Suez; Eilat; Aden (all USNM); Medina al Shuab, W.of Aden; A Tur, Bay of Suez (both AMS); PERSIAN GULF: Busher; Henjam I; E.S.E. of Bustani, 27°05'N & 53°02'E, 5-9 m; 6 km S.of Borishir; Ben-dar-Abbas (all ZMC); Tarut Bay (coll.Powell); Sth.of Kuwait (coll.Smythe); GULF OF OMAN: Dubai (AIM); Muskat (USNM); Mina al Fahal, 16 km W. of Muskat; Qurram near Muskat (both coll.Luther); EAST AFRICA: Mnemba, N.E.Zanzibar; Jembiani, 8 km S.of Paje, Zanzibar (both AIM); Bweju, S.E.Zanzibar; Malindi, N.of Mombassa; Zanzibar city; Mboa Maji, Tanganyika (all USNM); Ilhado Ibo, Mozambique (AMS); Raskamoni reef, Dar-es-Salaam, Tanzania (coll.Eker); Isla di Serpenti, Somalia (NZGS) MADAGASCAR: S.of Nossi-Be (USNM); Diego Suarez (ZMC); W. of Pt.Mahatsinjo, S.of Nossi-Be (AMS; AIM); SEYCHELLES IS: (AMS); Bay of Ternay, Mahe I (coll.Dale); MAURITIUS: (AMS; SDNHM; USNM); REUNION I: Lagon de la Saline (coll.Martin); SOUTH AFRICA: Durban, Natal (NZGS; USNM); Algoa Bay (AMS).

Fossil record. Bet-el-Ras, Zanzibar, Pliocene (Cox 1927).

The subspecies *plicatus* is confined to the western Indian Ocean. It is this *plicatus* subspecies which has frequently been confused with *Nassarius pullus* (Linnaeus) by authors. A small form with close-set, low axial ribs and prominent spiral sculpture has been named *N.obvelatus* (Deshayes).

I have examined 2 very worn specimens of *N.arcularia plicatus* from Bardawil, the Mediterranean side of the Suez Canal (*ex*-Prof.Al.Barash, Tel-Aviv University).

Nassarius coronatus (Bruguiére, 1789)
(Plate 1, figs. 10,11)

1789. *Buccinum coronatum* Bruguiére, Encycl.Meth.vers 1:277 (ref.Seba,3:148,pl.53,figs,28,38 and Schroeter, 1:329,pl.2,fig.4); 1825 Wood, Ind.Test. p.106,pl.22,fig.41; 1834 Kiener, Spéc.gen.icon,coq.viv. 9:97,pl.28,fig.112; 1858 Kuester, Syst.Conch.Cab.Martini & Chemnitz ed.2, 3(1a):36,pl.8,figs.4,5.
1849. *Buccinum bronnii* Philippi, Zeit.f.Malakozool. 5:137; 1849 Philippi, Abb.Beschr.Conchyl. 3:49,pl.1,fig,17 (non Anton, 1838).
1853. *Nassa coronata* Bruguiére, Reeve, Conch.Icon. 8:pl.3,figs.20a-c; 1877 Brazier, Proc. Linn.Soc.N.S.W. 1:177; 1864 Crosse & Fischer, J.Conchyl. 12:333; 1891 E.A.Smith, Proc.Zool.Soc.Lond. p.408; 1895 Melvill & Standen, J.Conch. 8:107; 1898 Melvill & Sykes, Proc.Malac.Soc.Lond, 3:37; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:409; 1911 Schepman, Siboga-Exped. 49d:312; 1919 K.Martin, Palaeozool. Kennt.Java p.83; 1929 Dautzenberg, Faune Colon.Franc. 3:407; 1932 Dautzenberg, J.Conchyl. 76:33; 1934 Mari, J. Conchyl. 78:6; 1955 Marche-Marchad, J.Conchyl. 95:31; 1959 Barnard, Ann.Sth.Afric.Mus. 45:109, fig.22j (radula); 1973 Kensley, Sea-shells Sth.Africa p.160,fig.590.
1853. *Nassa bronni* Philippi, Reeve,Conch.Icon. 8:pl.22,fig,149.

1918. *Nassarius coronatus* Bruguiére, Hedley, J.Proc.R.Soc.N.S.W. 51:M88; 1928 Melvill, Proc.Malac.Soc.Lond. 18:106; 1928 Tomlin, Ann.Sth.Afric.Mus. 25(2):317; 1930 Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:45; 1957 Kaicher, Indo-Pacif. sea shells pl.7,fig.10; 1961 Spry, Tanganyika Notes & Record No.56:23,pl.7,figs.168,169; 1972 Cernohorsky, Rec.Auckland Inst.Mus. 9:129, figs.6-9 (shell), fig.21 (radula); 1982 Kaicher, Card cat. world-wide shells, Pack No.31:card 3143.
1923. *Nassa coronata* var. *minor* Dautzenberg, J.Conchyl. 68:35; 1929 Dautzenberg, Faune Colon,Franc. 3:408 (nom.nud.).
1930. *Nassarius bronni* (Philippi), Bisacchi, Ann.Mus.Civ.Stor.Nat Genova 55:44.
1936. *Nassarius fasciolatus* (Gronovius), Hirase, Coll.Jap.shells ed.5:75,pl.106,fig,1; 1954 Kira, Col.Illust.shells Japan 1:56,pl.28,fig.23; 1955 Cotton, R.Soc.Sth.Aust.Malac.Sect. No.7:2,fig.20.
1938. *Nassa (Nassa) coronata* (Bruguiére), Adam & Leloup, Mem.Mus.R.d'Hist. Nat.Belg. 2:184.
1961. *Nassarius (Nassarius) coronatus* Bruguiére, Rippingale & McMichael, Queensl. & Gt.Barrier reef shells p.105,pl.13,fig.21.
1975. *Nassarius bruni (sic)* Philippi, Tchang Si et al., Studia Marina Sinica No.10:123,pl.4,fig.2.

Similar to *N.arcularia* in size and sculpture but more ovoid in shape with less prominent nodes at the body whorl suture and obsolete axial ribs on the last whorl, with the exception of 4-6 crowded axial on the back of the outer lip, protoconch of 2¾-3½ finely carinate embryonic whorls, carina frequently worn away; columellar callus smaller and narrower than in *N.arcularia*, not expanding laterally and with the edge usually fused to the body whorl. Mature specimens with small sharp denticles on the edge of the outer lip. Creamy-white, golden-brown, greenish or dark brown in colour, occasionally with paler spiral bands and a darker stain between sutural coronations, and conspicuous slightly irregular whitish lines within the colour pattern. Operculum brown and serrate on margins.

TYPE LOCALITY. Foulepoint, Madagascar *(coronatus)*; Java, Indonesia *(bronnii)*.

DISTRIBUTION. From the Red Sea and the Gulf of Oman to South Africa, Ryukyu Is and the Solomon Is. In sand, from the intertidal zone to 46 m.

Type specimens. The type of *Buccinum coronatum* Bruguiére, is no longer extant, and the figure 4 on plate 2 from Schroeter (1783-86) is here designated as the illustrated lectotype. The type of *B.bronnii* Philippi could not be traced.

Material examined. RED SEA: Eilat, Gulf of Aqaba (TAU; ZMC); Dahlak Archipelago (TAU); Aden (USNM); GULF OF OMAN: Muscat (USNM); Qurram, 16 km W. of Muscat (coll.Luther); EAST AFRICA: Raskamoni reef, Dar-es-Salaam, Tanzania (AIM); Kepwani, S.W.Zanzibar (coll.Powell); Chisimaio, Isla del Serpenti, Somalia (NZGS); Mozambique; Bungi, Kiwani Bay, Zanzibar; Diana Beach, Kenya (all USNM); Ilha do Ibo, Mozambique, 12°20'24"S & 40°34'30"E (AMS); MADAGASCAR: Bay of Cape Diego (ZMC); Tulear (SMOM); Grand Recif, Tulear (coll.Eker); Nossi-Be (USNM); E. of Mahatsinjo, S. Nossi-Be (coll.Powell); SEYCHELLES IS: Bay of Ternay, Mahe I (coll.Dale); MAURITIUS: (ZMC); SOUTH AFRICA: Durban, Natal (USNM; NZGS); Algoa Bay (AMS); SRI LANKA: (coll.Eker); ANDAMAN IS: (ZSI); NICOBAR IS: (ZSI); Kai Nicobar (ZMC); THAILAND: Terutas I (ZMC); Rawai, Phuket (PMBC); Gok Sindarar Nua (USNM); MALAYSIA: Sambelong; Pulu Milu (both ZMC); Singapore (AMS); INDONESIA: Lontor, Banda I (ZMC); Pulau Putri, Pulau Seribu, off Jakarta (coll.McCausland); Marudu Bay, N.Borneo; Mandi Darah I, N.Borneo (both USNM); Kalahabi harbour, Alor I, N.of Timor; Sunar Beach, Bali (both coll.McCausland); PHILIPPINES: Cebu I (AIM; USNM); St.Cruiz I, Zamboanga (ZMC); between Siasi and Bongao I, Sulu Sea; Simonor I, Tawi Tawi group; Puerto Princessa, Palawan; near Dalman Bay, Mindoro (all USNM); Ligtang, Rosario, S.tip of Manila Bay (coll.Deynzer); Punta Engano, Mactan I, Cebu (coll.Munro); Dungaree Beach, Subic Bay (coll.Salisbury); CHINA: Hong Kong (AIM); TAIWAN: (coll.Saltzgaver); RYUKYU IS: Onna Flats, S.Kunigami-Gun, Okinawa; near Ora Wau, Okinawa (both USNM); Seragaki, S.of Onna Pt. (coll.Deynzer); PALAU IS: Schonian Harbour, N.Peleliu I (coll.Powell); Arakabesan I, near Koror I; near Uruk Thapal I (both coll.McCausland); PAPUA NEW GUINEA: Motukere I (NZGS); Manus I, Bismarck Archipelago (ZMC); Palikau village, Mussau I, New Ireland (coll.Parkinson); Kavieng area, New Ireland; off Samarai; Kololo, New Britain (all AMS); SOLOMON IS: Paruru, Guadalcanal (Auckland Univ.); Tulagi I, Florida group (coll.Hallinan); Buin Bay, Bougainville (USNM); Wagina I, Choiseul I (AMS); AUSTRALIA: Queensland: Lindeman I, Whitsunday Passage; Low Isles near Cairns; Peel I, Moreton Bay; Heron I; Gloucester I; Northwest I, Capricorn group; Nth.Keppel I; Murray I, Torres Str.; Langford reef, N.of Mackay; Bowen; Darnley I, Torres Str.; Magnetic I, off Townsville; near Eagle I, Lizard I; Hayman I; Green I; Albany Passage, Cape York; Batt reef, off Port Douglas; Bampton I; Yorke I, Torres Str.; Thursday I, Torres Str.; Kurrimine Beach; Yorkey's Knob, N.of Cairns; Sth.Molle I (all AMS); Caloundra (coll. Powell); Hayman I; Bowen; Scaffel I, Mackay (all USNM); Lizard I (coll.Willan); Yeppoon (coll.Gardner); New South Wales: Manly Beach, Sydney (AMS); LOYALTY IS: behind Cape des Pins (AMS).

Fossil record. PLIOCENE: Sondé, Java (K.Martin 1919).

Dautzenberg & Bouge's (1933) record of "Tuamotus" requires confirmation, as the species does not appear to live east of New Caledonia.

Nassarius optimus (Sowerby, 1903)
(Plate 2, figs. 1, 2)

1903. *Nassa optima* Sowerby, J.Malac. 10:73,pl.5,figs.1,2.

Shell up to 26.0 mm in length, elongate-ovate, body whorl rounded, teleoconch of 6½-7½ convex whorls, protoconch incomplete but of more than 2 embryonic whorls; sculptured with strong, slightly sloping axial ribs which are weakly constricted at sutures by a shallow subsutural groove, axial ribs becoming obsolete on the dorsal side of the body whorl with the exception of 3-5 ribs on the back of the outer lip; interspaces of axial ribs smooth or with 2-3 finely incised, short grooves. Outer lip convex, thickened and with 10-14 lirate denticles, columella with an expanded callus and 6-13 small nodules and 1-3 lirae, siphonal notch deep, base of body whorl with 4-5 cords and 5-7 cords on the siphonal fasciole. Spire whorls brownish, body whorl greyish-brown to steel-gray with a narrow, pale central band. aperture white on edge and brown to bluish-brown within.

TYPE LOCALITY. N.W. Australia.

DISTRIBUTION. From Indonesia to the Philippines, North Australia and New Caledonia. In muddy sand, from the intertidal zone to 10 m.

Type specimens. The holotype of *N.optimus* (Sowerby) is in the British Museum (N.H.), London, No.1903.11.5.4., length 25.1 mm, width 14.8 mm.

Material examined. INDONESIA: Tanjong Aru, Jesselton, N.Borneo (USNM); Kuta Beach, Bali (coll.McCausland); Labuan, Sabah, Borneo (coll.Richardson); PHILIPPINES: Mindanao (USNM); PAPUA NEW GUINEA: Aroma (AMS); Laing I, Hansa Bay, 5-10 m (coll.Tursch); NEW HEBRIDES: Efate I (coll.Lepage); NEW CALEDONIA: Poindimie (AMS); AUSTRALIA: Queensland: Yorkey's Knob, N.of Cairns; Four-Mile Beach, Port Douglas; Magnetic I (all AIM); Northwest I, Capricorn group; Buchan's Pt., near Cairns; Pebbly Beach; Cairns Harbour; Beach between Mossman and Daintree; near Hartley's creek; Great Palm I (all AMS); Green I (coll.Cole); Double I, near Cairns (NMV); Newell Beach (coll.Boorman).

Subgenus **Alectrion** (Montfort, 1810)

1810. *Alectrion* Montfort, Conch.Syst. 2:56. Type species by OD *A.papillosus* = *Buccinum papillosum* Linnaeus, 1758.

1827. *Alectryon* Berthold in Latreille, Nat.Fam.Thierr. pp.187,564 (invalid emendation.)

Shell moderate in size, up to 60.0 mm in length, occasionally inflated, sometimes moderately thin, sculptured with prominent or obsolete axial ribs or spinose nodes; columella calloused but not expanded, completely smooth apart from a parietal denticle. Outer lip only moderately thickened, finely lirate or completely smooth, edge of outer lip frequently with spinose denticles.

Rachidian teeth of radula multicuspid, laterals with 2 simple cusps but occasionally denticulate in between cusps and on outward edge of the inner cusps; an accessory lateral plate is present.

GEOGRAPHICAL DISTRIBUTION. Tropical and temperate Indo-Pacific.

STRATIGRAPHICAL RANGE. Pleistocene to Recent.

The subgenus contains 4 Recent species and 2 subspecies from the tropical Indo-Pacific.

Species of the subgenus *Alectrion* differ from *Nassarius s.str.* in its thinner and less strongly sculptured shell, a much smaller and more constricted, fused columellar callus, edentulous columella and smooth or finely lirate aperture.

Nassarius (Alectrion) papillosus (Linnaeus, 1758)
(Plate 2, figs. 3, 4)

1758. *Buccinum papillosum* Linnaeus, Syst.Nat.ed.10:737 (ref.Rumphius, pl.29,fig.M and d'Argenville, pl.12,fig.I); 1816 Lamarck, Tabl.Encycl.Meth. p.2,pl.400,figs.2a,b; 1826 Wood, Ind.Test.p.106,pl.22, fig.37a; 1834 Kiener, Spéc.gen.icon.coq.viv. 9:58,pl.15,fig,54; 1956 Dodge, Americ.Mus.Nat.Hist.Bull. 111:188.

1842. *Nassa papillosa* (Linnaeus), Reeve, Conch.Syst. 2:237,pl.169,fig.5; 1853 Reeve, Conch.Icon. 8:pl.2,fig.12; 1890 E.A.Smith, J.Conch. 6:266; 1907 Couturier, J.Conchyl. 55:138; 1908 Hirase, Conch.Mag.Kyoto 2:pl.29,fig.78; 1909 E.A.Smith, Proc.Malac.Soc.Lond. 8:369; 1922 Hornell, Madras Fish.Bull. 14:214; 1959 Barnard, Ann.Sth.Afric.Mus. 45:118.

1895. *Nassa (Alectryon) papillosa* (Linnaeus), Melvill & Standen, J.Conch. 8:107; 1911 Schepman,Siboga-Exped. 49d:316; 1929 Dautzenberg, Faune Colon.Franc. 3:409; 1955 Marche-Marchad, J.Conchyl. 95:36.

1899. *Nassa (Alectrion) papillosa* (Linnaeus), Melvill & Sykes, Proc.Malac.Soc.Lond. 3:221; 1933 Dautzenberg & Bouge, J.Conchyl. 77:215.

1929. *Nassa (Alectryon) papillosa* var. *seminuda* Dautzenberg, Faune Colon.Franc. 3:203 (ref.Tryon, 1882, pl.9,figs.71,74).

1952. *Nassarius papillosus* (Linnaeus), Morris, Field Guide shells Pacif.& Hawaii p.190,pl.39,fig,16; 1955 Cotton, R.Soc.Sth.Aust.Malac.Sect. No.2:2,fig.17; 1957 Demond, Pacific Science 11:320; 1957 Kaicher, Indo-Pacif. sea shells pl.7,fig,25; 1967 Orr-Maes, Proc.Acad.Nat.Sci.Phildadelphia 119:136; 1971 Brost & Coale, Guide shells Kwajalein p.117,pl;.25,fig.6; 1971 Anonymous, Hawaiian Shell News 19(3):1 (animal); 1975 Tchang Si *et al.* Studia Mar.Sinica No.10:123,pl.4,fig.1.

1952. *Alectrion papillosus* (Linnaeus), Tinker, Pacific sea-shells p.82,top fig.left and right; 1960 MacNeil, U.S.Geol.Surv.Prof.Pap. No.339:79, pl.19,figs.17,18; 1967 Habe & Kosuge, Shells world col. 2:63,pl.22,fig.37; 1968 Rehder, Ann.Repts.Americ.Malac.Union p.31; 1971 Wilson & Gillett, Austral.shells p.102,pl.66,figs.1,la.

1954. *Nassarius (Alectrion) papillosus* (Linnaeus), Kira, Col. Illust.shells Japan 1:56,pl.28,fig.28; 1963 Shikama, Select. shells world col. pl.1:67,fig.21; 1972 Cernohorsky, Rec.Auckland Inst.Mus. 9:178,fig.134; 1977 Salisbury, Hawaiian Shell News 25(2):5,fig.1.

1964. *Cominella (Eucominella) nassoides foveauxana* Powell, Shikama, Select. shells world col. 2:120,pl.65,fig.6 (non Powell, 1946).

Shell up to 52.0 mm in length, solid, teleoconch of 7-8 mature whorls and protoconch of 2½-2¾ glassy-brown, keeled embryonic whorls; sculptured with strong axial ribs which are constricted below sutures and thickened to produce axially elongate nodules upon the ribs. Outer lip thickened and with spinose denticles on the edge, aperture very finely striate, columella calloused and smooth, anal and siphonal canals distinct, parietal denticle present. Base colour cream, often with a pinkish cast, ornamented with brown between axial ribs, dorsum of body whorl usually with a large orange-brown to dark brown blotch, aperture white to creamy-white, apex pink or rose in colour. Operculum dark brown, margins bluntly ragged or obsoletely serrate.

TYPE LOCALITY. Asiatic Ocean *(papillosus)*; Madagascar *(seminuda)*. The type locality is here restricted to Java, Indonesia.

DISTRIBUTION. From Madagascar to the Andaman Is, Japan, Hawaii and the Tuamotu Archipelago. In sand and under coral, from the intertidal zone to 92 m.

Type specimens. Three specimens of *N.papillosus* (Linnaeus) are in the Linnean collection, London, and the specimen marked "393" on the columella, which is the number of the species in the 10th edition of the "Systema Naturae", length 46.4 mm, width 21.5 mm, is most probably the holotype of *N.papillosus*. The second specimen bears the number "455" on the columella, which is the species number in the 12th edition of the "Systema Naturae" and the third specimen is marked "Java", a locality mentioned by Linnaeus in a manuscript note. The type of *seminuda* Dautzenberg is probably in the Institute Royal des Sciences Naturelle, Brussels.

Material examined. MADAGASCAR: Tulear (SMOM); REUNION IS: Lagon de la Saline, to 60 m (coll.Martin); MAURITIUS: (AMS); DIEGO GARCIA IS: (AMS); THAILAND: Gok Jindarar Nua (USNM); Pulau Andana, Phuket (coll.Ritter); INDONESIA: Amboina (coll.Powell); COCOS-KEELING IS: (AMS); Cocos lagoon, 3-5 m (USNM); PHILIPPINES: Fuga I (USNM); Manila (LACM); Punta Engano, Mactan I, Cebu (col 1.Dan); CHINA: Hongkong (USNM); TAIWAN: (coll.Allo); RYUKYU IS: Okinawa (USNM); Seragaki, Okinawa (coll.Deynzer); JAPAN: Osima, Osumi (USNM); MARIANAS IS: Nth.Tipalao Pt.,Guam I (coll.Salisbury); Apra harbour, Guam I (USNM); off Orote Pt,; Guam I, 16-21 m (coll.Deynzer); CAROLINE IS: N.W. Koror, Palau Is; Yap I; Ifaluk Atoll (all USNM); MARSHALL IS: Wotho Atoll; Lae Atoll; Kwajalein Atoll; Taka Atoll; Pinglap I and Enybor I, Jaluit Atoll; Ujae Atoll (all USNM); Enewetak Atoll, 8 m (coll.Johnson); GILBERT & ELLICE IS: Anotoa Atoll, Gilbert Is (USNM); WEST IRIAN: Biak (AMS); PAPUA NEW GUINEA: Rabarua, E.New Britain (coll.Parkinson); SOLOMON IS: Tulagi I, Florida group (coll.Hallinan); off Sunday reef, Vanikoro,Santa Cruz I (AMS); AUSTRALIA: West Australia: Pt.Samson; (coll.Marrow); N.W.Cape, Vlaming Head (LACM); Queensland: Fairfax I (USNM); Lihou reef, Coral Sea; Herald Cay; Spur reef, N.of Cairns; Lady Musgrave I; Fairfax I, Bunker group; Lady Elliot I (all AMS); FIJI IS: Manava I, N.off Viti Levu (coll.Eker); NAURU: (AMS); SAMOA: Sogi, Apia (coll.Scott); NIUE I: (coll.McDowall); Avatele (USNM); FANNING I: (AIM; SDNHM); COOK IS: Rarotonga (AIM); Maruae I, Hervey I (USNM); AUSTRAL IS: Moerai Bay, Rurutu, Tubuai I (USNM); SOCIETY IS: Patutoa (USNM); Faopore, Tahaa I (LACM); Mahina, Tahiti (coll.Trondle); Tahiti (LACM); TUAMOTU ARCHIPELAGO: Anaa I (coll.Trondle); Vahitahi (AMS); MARQUESAS IS: Motu Takatai, Uatuka; Taiohae Bay, Nukuhiva; Hanauu Bay, Fatuhiva (all USNM); Anahu Bay, Nukuhiva (AMS).

Nassarius (Alectrion) glans glans (Linnaeus, 1758)

(Plate 2, figs. 5-7)

1758. *Buccinum glans* Linnaeus, Syst.Nat.ed.10:737 (ref.Rumphius, pl.29, fig.P etc.); 1825 Wood, Ind.Test. p.106, pl.22, fig.38; 1834 Kiener, Spéc.gen.icon.coq.viv.9:54, pl.15, fig.52; 1858 Kuester, Syst.Conch. Cab.Martini & Chemnitz, ed.2, 3(1A):19, pl.5, figs.1-3.

1798. *Buccinum lineatum* Roeding, Mus.Bolten. p.112 (ref.Chemnitz, 4:pl.125, figs.1196-1200) [non da Costa, 1778].
1811. *Ancilla lineata* Perry, Conchology, pl.31, fig.7.
1822. *Buccinum suturale* Lamarck, Hist.nat.anim.s.vert. 7:269; 1834 Kiener, Spéc.gen.icon.coq.viv.9:55, pl.24, fig.96; 1858 Kuester, Syst.Conch.Cab. Martini & Chemnitz ed.2, 3(1A):20, pl.5, figs.4,5.
1853. *Nassa glans* Linnaeus, Reeve, Conch.Icon. 8:pl.1, fig.5: 1907 Schepman, Samml.geol.Reichs-Mus.Leiden, (1), 8:174; 1908 Hirase, Conch.Mag.Kyoto, 2:pl.29, figs.70,71; 1934 Mari, J.Conchyl. 78:19; 1959 Barnard, Ann. Sth.Afric.Mus. 45:108.
1853. *Nassa suturalis* Lamarck, Reeve, Conch.Icon. 8:pl.1, figs.4a,b; 1908 Hirase, Conch.Mag.Kyoto 2:pl.29, fig.72; 1952 Satyamurti, Bull.Madras Govt.Mus. N.S., 1:184, pl.17, figs.7a,b; 1934 Mari, J.Conchyl. 78:20.
1866. *Nassa intermedia* Dunker, Verh.zool.-bot.Gesell. Wien 16:909; 1867 Frauenfeld, "Novara" Exped.,Zool.Moll. 2:5, pl.1, fig.2; 1907 Couturier, J.Conchyl. 55:139 (non Forbes, 1844).
1877. *Nassa (Alectrion) suturalis* Lamarck, Brazier, Proc.Linn.Soc.N.S.W. 1:180; 1895 Pilsbry, Cat.Mar.Moll.Japan p.34.
1879. *Nassa (Alectrion) glans* Linnaeus, E.A.Smith, Proc.Zool.Soc.Lond. p.210; 1895 Pilsbry, Cat.Mar.Moll.Japan p.34; 1908 Hirase, Conch.Mag.Kyoto 4:27, pl.8, fig.45.
1895. *Nassa (Alectryon) glans* Linnaeus, Melvill & Standen, J.Conch.8:107; 1955 Marche-Marchad, J.Conchyl. 95:35.
1895. *Nassa (Alectryon) suturalis* Lamarck, Melvill & Standen, J.Conch. 8:167.
1908. *Nassa suturalis dunkeri* Suter, Trans.Proc.N.Z.Inst. 40:350 (nom.subst. pro *Nassa intermedia* Dunker, 1866).
1912. *Arcularia glans* Linnaeus, Verco, Trans.R.Soc.Sth.Australia 36:204; 1916 Hedley, J.R.Soc.W.Australia 1:61.
1916. *Arcularia suturalis* Lamarck, Hedley, J.R.Soc.W.Australia 1:61.
1928. *Nassarius (Alectrion) glans* Linnaeus, Melvill, Proc.Malac.Soc.Lond.18:106; 1946 Habe, Jap.J.Malac. 14:196, textfig.18 (radula); 1954 Kira, Col.Illust.shells Japan 1:56, pl.28, fig.26; 1961 Rippingale & McMichael, Queensld. & Gt.Barrier shells p.105, pl.13, fig.23.
1933. *Nassa (Alectrion) intermedia* Dunker, Dautzenberg & Bouge, J.Conchyl. 77:213.
1936. *Nassarius glans* (Linnaeus), Hirase, Coll.Jap.shells ed.5:75, pl.106, fig.3; 1957 Kaicher, Indo-Pacif.seashells pl.7, fig.13; 1972 Abbott, Kingdom Seashell p.14, bottom fig. (animal); 1975 Salvat & Rives, Coquill.Polynesie p.321, fig.230.
1963. *Nassarius (Alectrion) suturalis* Lamarck, Shikama, Sel.shells world col.1: pl.67, fig.19.
1967. *Alectrion glans* Linnaeus, Habe & Kosuge, Stand.book Jap.shells col. 3:76, pl.29, fig.37; 1970 Okutani, Jap.J.Malac. 29:124, pl.8, fig.2 (shell), textfig.1 (radula); 1971 Wilson & Gillett, Austral.shells p.102, pl.66, figs.11,11a.
1971. *Alectrion glans nipponensis* Kuroda & Habe, Sea shells Sagami Bay, p.176, pl.48, fig.3 (illust.spec.juv).
1972. *Nassarius (Alectrion) glans glans* (Linnaeus), Cernohorsky, Rec.Auckland Inst. Mus.9:180, figs.135,136 (shell), fig.146 (radula).

Shell up to 60.0 mm in length, elongate-ovate, body whorl inflated, teleoconch of 7-8¼ convex whorls, protoconch of 1½ smooth, glassy-brown embryonic whorls; post-embryonic whorls sculptured with axial riblets and 4 bisecting spiral cords which form nodules upon ribs, sculpture usually absent on last 2 whorls but rare examples with axial ribs and a few sutural nodules on body whorl. Aperture wide, outer lip convex and with a few spinose denticles on edge, interior finely striate, columella with a smooth, laminated callus and 1 parietal and 1 basal fold, siphonal notch and anal canal distinct, siphonal fasciole with 4-6 weak, oblique cords. White in colour, upper spire whorls tipped with violet, remainder ornamented with wide-spaced orange-brown spiral lines, a few brown streaks and usually a large brown blotch on the dorsal side of the body whorl. Operculum uniformly brown, margins simple or ragged, but not serrate.

TYPE LOCALITY. Asiatic Ocean *(glans)*; none *(lineatum* Roeding and *lineata* Perry; *suturale)*; Sydney, Australia = error! *(intermedia)*; Tomioka, Amakusa, Kyushu, Japan *(nipponensis)*.

DISTRIBUTION. From the Persian Gulf to India, Japan and the Marquesas Is. From the intertidal zone to 117 m.

Type specimens. The holotype of *N.glans* (Linnaeus) is in the Linnean Society collection, London, and the holotype of *glans nipponensis* Kuroda & Habe, is probably in the Emperor of Japan's private collection. The types of *Buccinum lineatum* Roeding, *B.suturale* Lamarck, and *Nassa intermedia* Dunker, could not be traced.

Material examined. GULF OF OMAN: Mina Al Fahal,Muscat (coll.Bosch); EAST AFRICA: Mozambique (USNM); MAURITIUS: (AMS; SDMNH); THAILAND: Kao Tao, Gulf of Thailand (USNM); PHILIPPINES: Davao, Mindanao; Tapul I (both USNM); Punta Engano, Mactan I, Cebu (coll.Dan); Ligtang, Rosario, S.tip of Manila Bay (coll.Deynzer); TAIWAN: (coll.Allo); RYUKYU IS: Okinawa (USNM); Seragaki, Okinawa (coll.Deynzer); JAPAN: Misaki (ZMC); Mikawa (coll.Powell); Osima, Osumi; Kagoshima; Chichijima, Bonin

Is (all USNM); Kusui, Nado Cho, Wakayama (coll.Eker); Najima, Wakayama-Ken, 92 m (AMS); off Wakayama Pref., Honshu, 20 m (NSMT); CAROLINE IS: off Korak I, S. of Babelthuap, Palau Is (coll. Powell); Moen, Truk I (coll.McCausland); MARSHALL IS: Rongelap Atoll (USNM); Enewetak Atoll, 10 m (coll.Johnson); PAPUA NEW GUINEA: Port Moresby; Nimoa I, Louisiade Archipelago (both AMS); AUSTRALIA: West Australia: Coral Bay between Carnarvon and N.W.Cape; Learmonth, Exmouth Gulf (both coll.Hansen); Aiport Beach, Barrow I; between Cape Dupuy and Cape Malouet, Barrow I (both USNM); Monte Bello I; Broome; E.side of Exmouth Gulf township; Bandicoot Bay, Barrow I, 20°52'S & 115°19'E (all AMS); Northern Territory: Lee Pt., Darwin; Croker I, Arnhem Land; Black Pt., Port Essington, Coburg Peninsula (all AMS); Queensland: Bowen; Kurrimine Beach; Horseshoe Bay, Magnetic I; Cape Moreton, 117 (all AIM); near Gladstone (USNM); Pilot Pt., Bowen; Dunk I; Brampton I; Lady Elliott I; Long I; Townsville; Fairfax I, Bunker group; Port Douglas; Yeppoon; Yirrkalla, Arnhem Land; Lindeman I; Palm I; off Woody I, Fraser I, 9 m; Gloucester I; Dingo Beach, Proserpine; Friday I, Torres Str.; Seaforth near Mackay; Hayman I (all AMS); SOLOMON IS: Utuna Passage, Florida I, 12-15 m (coll.Dillworth); Tulagi I, Florida group (coll.Hallinan); LOYALTY IS: Ouvea I (coll.Cole); Lifu I (AMS); NEW CALEDONIA: Anse Vata (AIM; AMS); Plage de Bourail (AIM); Noumea (ZMC); Baiė de Citron (coll.Cole); 22°17'S & 167°05'E, 80 m (MNHNP); Baie de Mondoure, Noumea (WOC); NEW HEBRIDES: Hideaway I, Efate I (coll.Cole); FIJI IS: Manava I, N. off Viti Levu (coll.Eker); Ketei, Totoya I (USNM); Nadi (AMS); Ogea I, Lau group (coll.Northgrove); TONGA IS: Nuku'alofa (USNM); SAMOA IS: (USNM); E.coast road past Solosolo, 11 m (coll.Scott).

Fossil record. PLEISTOCENE: Kere River, Santo I (USGS).

Nassarius glans glans has 2 subspecies, i.e. *N.glans particeps* (Hedley), from temperate waters of southern Australia (see Cernohorsky 1981a) and *N.glans fenwicki* Kilburn, 1972, from South Africa.

Nassarius (Alectrion) glans fenwicki Kilburn, 1972
(Plate 2, fig.8)

1901. *Nassa algida* "Reeve", E.A.Smith, J.Conch. 10:111, pl.1, fig.17; 1928 Tomlin, Ann.Sth.Afric.Mus. 25:313 (non Reeve, 1853).
1959. *Nassa glans* (Linn.), Barnard, Ann.Sth.Afric.Mus. 45:108 (non *Buccinum glans* Linnaeus, 1758).
1972. *Nassarius fenwicki* Kilburn, Ann.Natal Mus. 21:416, textfig.14a.

Similar in most respects to the nominate Indo-Pacific subspecies *N.glans glans* (Linnaeus), and differs only in one constant character which is the absence of the brown, wide-spaced spiral lines in *N.glans fenwicki*.

TYPE LOCALITY. Durban, South Africa.

DISTRIBUTION. From Chaka's Rock, Umhlali district to Mzamba, Pondoland, South Africa.

Type specimens. The holotype of *N.glans fenwicki* Kilburn, is in the Natal Museum, Pietermaritzburg, No.8952 (T-1638), length 22.3 mm, width 11.7 mm.

Material examined. SOUTH AFRICA: Durban, Natal (USNM); Durban Bay, Natal (coll.Meyer).

When Kilburn (1972) described his *N.fenwicki*, he differentiated it from *N.glans* on the basis of the absence of brown spiral lines and presence of a markedly lirate aperture. It is true that *N.glans* always has brown spiral lines, however, the interior of the aperture can be either prominently closely lirate, or lirae may be almost obsolete. The animal of all 3 subspecies is white and flecked with black.

Nassarius (Alectrion) psila (Watson, 1882)
(Plate 2, figs.9,10)

1882. *Nassa psila* Watson, J.Linn.Soc.Lond. 16:364.
1886. *Nassa (Alectrion) psila* Watson, Rept.Sci.Res.Voy.H.M.S."Challenger" 15:179, pl.11, figs.4a-c.
1979. *Nassarius (Zeuxis) psila* (Watson), Cernohorsky, Trop.Pacif.Mar.shells p.88, pl.27, fig.6 (figd.holotype).
1981. *Nassarius (Alectrion) psila* (Watson), Cernohorsky, Rec.Auckland Inst.Mus. 18:147, fig.13.

Shell 19.0 mm in length, thin and translucent, sutures narrowly ledged, teleoconch of 6 slightly convex whorls, protoconch of 3 glassy, keeled embryonic whorls; post-embryonic whorls with slanting, slender axial ribs and sutural gemmules, penultimate whorl with 28 ribs which become progressively obsolete and finally absent on the body whorl; upper spire whorls with weak spiral grooves in interspaces, last two whorls with occasionally obsolete spiral rows of small pits, base of shell with 14 low spiral cords, body whorl suture with a fine sutural girdle. Aperture finely striate within, outer lip and columella edentulous, lower half of columella laminate. Translucent white, body whorl with 2 brown bands.

TYPE LOCALITY. St.185B, Raine I, Torres Strait, Australia, 11° 38'15"S & 143°59'38"E, 155 fathoms (284 m).

DISTRIBUTION. Known only from Torres Strait, Australia.

Type specimens. The holotype of *N.psila* (Watson), is in the British Museum (N.H.), London No.1887.2.9.636., length 19.0 mm, width 10.0 mm.

The species is known only from the holotype. It superficially resembles *N.glans glans* (Linnaeus), but apart from other differences, *N.glans* has 1½-1¾ embryonic whorls whereas *N.psila* has 3.

Nassarius (Alectrion) hirtus (Kiener, 1834)
(Plate 2, figs.11-13)

1834. *Buccinum hirtum* Kiener, Spéc.gen.icon.coq.viv. 9:63, pl.19, fig.72; 1858 Kuester, Syst.Conch.-Cab.Martini & Chemnitz ed.2, 3(1A):17, pl.4, figs.17,18.
1852. *Nassa (Alectrion) seminodosa* A. Adams, Proc.Zool.Soc.Lond. p.104.
1853. *Nassa seminodosa* A.Adams, Reeve, Conch.Icon. 8:pl.1, fig.3.
1853. *Nassa hirta* Kiener, Reeve, Conch.Icon. 8:pl.1, fig.1.
1933. *Nassa (Alectrion) seminodosa* A.Adams, Dautzenberg & Bouge, J.Conchyl. 77:215.
1952. *Alectrion hirtus* (Kiener), Tinker, Pacif.sea shells p.82, bottom figs.
1957. *Nassarius hirtus* (Kiener), Kaicher, Indo-Pacif.sea shells pl.7, fig.14; 1977 Salisbury, Hawaiian Shell News 25(2):5, fig.2; 1979 Kay, Hawaiian mar.shells p.274, fig.95G; 1982 Kaicher, Card cat.world-wide shells, Pack No.31:card 3233.
1972. *Nassarius (Alectrion) hirtus* (Kiener), Cernohorsky, Rec.Auckland Inst.Mus. 9:182, fig.139.
1974. *Nassarius hirta* Quirk & Wolfe, Seashells of Hawaii, p.20, fig.4.
1975. *Nassarius papillosus* (Linne) [pars], Salvat & Rives, Coquill.Polynesie p.320, upper figs.229 only (non *Buccinum papillosum* Linnaeus, 1758).

Shell up to 35.0 mm in length, teleoconch of 6½-7½ convex whorls, protoconch of 2 smooth, pink embryonic whorls, sutures narrowly canaliculate; post-embryonic whorls with 3 rows of small nodules upon axial ribs, nodules obsolete or absent on last 2-3 whorls; sculptured with distinct axial ribs which are slightly constricted anterior to sutures, axial ribs either distinct all the way to the body whorl or ribs obsolete on last 2 whorls. Outer lip convex and thickened, occasionally with a few spinose denticles on edge, variced on the back, interior of aperture with up to 20 striae, columella calloused but thinning above parietal wall, smooth apart from a basal and parietal denticle, siphonal and anal notch distinct, base of body whorls with 4-5 spiral cords, siphonal fasciole with 5-6 oblique cords. Base colour creamy-white, banded with light or dark fawn to reddish-brown, central band on body whorl occasionally dilacerated. Operculum semi-circular and with 1-2 ill-defined, small denticles on either side of the base.

TYPE LOCALITY. New Holland and Tongatabu = error! *(hirtus)*; Anaa I, Tuamotu Archipelago *(seminodosa)*.

DISTRIBUTION. From the Hawaiian Is to French Polynesia. In sand, from the intertidal zone to a depth of 20 m.

Type specimens. The type of *N.hirtus* (Kiener) could not be located, but his original type figures are a very good representation of the species. Two syntypes of *Nassa seminodosa* A. Adams, are in the British Museum (N.H.), London, No.1973134.

Material examined. HAWAIIAN IS.: Hilo; Honolulu (both ZMC); Kakaako, Honolulu (AIM), Electric Beach, Oahu, 18 m (coll.Salisbury); Pearl Harbour, Oahu; Honolulu reef, Oahu; Hilo; Quarantine I, Honolulu; Kauai I; Sand I; Midway I; Wake I (all USNM); Niihau I (LACM); TUAMOTU ARCHIPELAGO: Anaa I (BMNH); MARQUESAS IS: (LACM).

N.hirtus must be extremely rare in French Polynesia judging from the paucity of records in the major Museums.

Subgenus **Plicarcularia** Thiele, 1929

Plicarcularia Thiele, 1929, Handb.syst.Weicht. 1:324. Type species by M *Nassa (Plicarcularia) thersites* (Bruguière) = *Buccinum pullus* Linnaeus, 1758. Recent, Indo-Pacific.

1826. *Eione* Risso, Hist.nat.Europ.merid. 4:171. Type species by SD (Herrmannsen, 1847) *Buccinum gibbosulum* Linnaeus, 1758. Recent, Mediterranean. (non *Eione* Rafinesque, 1814).
1936. *Parcanassa* Iredale, Rec.Austral.Mus. 19:322. Type species by OD *P.ellana* Iredale, 1936 = *Buccinum burchardi* Dunker in Philippi, 1849. Recent, S.E.Australia.
1956. *Austronassaria* C. & J. Laseron, Proc.R.Zool.Soc.N.S.W. for 1854, The Marine Zoologist p.71. Type species by M *A.simplex* C. & J. Laseron, 1956 (non S.V.Wood, 1872) = *Buccinum jonasii* Dunker, 1846 (based on a very worn juvenile specimen). Recent, S.E.Australia.
1969. *Retiarcularia* Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19:23 (nomen nudum).
1969. *Chelenassa* Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19:142. Type species by OD *Nassarius (Chelenassa) elegantissimus* Shuto, 1969. Late Pliocene, Indo-Pacific.

Shell similar to *Nassarius s.str.* but smaller, rarely exceeding 20.0 mm in length, more elongate-ovate, columellar callus generally spreading in a longitudinal direction; aperture very small and narrow, denticulate or plicate, sculptured with axial ribs and spiral threads, siphonal canal short. Operculum brown, simple, ragged or serrate at the margin.

Inner cusp of lateral tooth of radula has a tendency to become denticulate on outer cutting edge, but at least two species have simple cusps as in *Nassarius*; an accessory lateral plate present.

GEOGRAPHICAL DISTRIBUTION. Tropical and temperate Indo-Pacific.

STRATIGRAPHICAL RANGE. Pliocene to Recent.

The subgenus contains 16 Recent tropical Indo-Pacific species and 3 fossil species. Another two species live in S.E. Australian waters.

Nassarius (Plicarcularia) pullus (Linnaeus, 1758)
(Plate 3, figs.1-9)

1758. *Buccinum pullus* Linnaeus, Syst.Nat. ed.10:737; 1825 Wood, Index Test. p.106, pl.22, fig.43; 1956 Dodge, Americ.Mus.Nat.Hist.Bull. 111:190.
1789. *Buccinum thersites* Bruguière, Encycl.Meth.hist.nat.vers 1:279 (ref. Martini, 2:pl.41, fig.413 etc.); 1825 Wood, Index Test. p.106, pl.22, fig.44; 1833 Quoy & Gaimard, Voy.l'Astrolabe 2:447, pl.32, figs.22-24 (animal); 1834 Kiener, Spec.gen.icon.coq.viv. 9:99, pl.28, fig.113.
1798. *Cassis pullus* Roeding, Mus.Bolten. p.28 (ref.Martini, 2: fig.413).
1816. *Nassa thersites* (Bruguière), Lamarck, Tabl.Encycl.Meth. p.1, pl.394, figs.8a,b; 1842 Reeve, Conch.Systematica 2:236, pl.169, fig.2; 1853 Reeve, Conch.Icon. 8:pl.10, fig.65; 1887 v.Martens, J.Linn.Soc.Lond. 21:182; 1889 Morlet, J.Conchyl. 37:135; 1919 K.Martin, Paleozool.Kennt.Java p.83; 1927 Fischer in Wanner, Palaeont.Timor, Lief. 15(25):33; 1931 van der Vlerk, Leid.Geol.Meded. 5:234; 1936 King & Ping, Hongkong Natur. 7(2):126, fig.5; 1952 Satyamurti, Bull.Madras Govt.Mus. N.S., 1:183, pl.17, figs.6a,b.
1852. *Nassa (Eione) dorsuosa* A. Adams, Proc.Zool.Soc.Lond. Pt.19:102.
1853. *Nassa dorsuosa* A. Adams, Reeve, Conch.Icon. 8:pl.21, figs.141a,b.
1868. *Nassa gracilis* Pease, Americ. J.Conch. 3(4):273, pl.23, fig.4.
1877. *Nassa (Arcularia) thersites* (Bruguière), Brazier, Proc.Linn.Soc.N.S.W. 1:179; 1883 K.Martin, Samml.geol.Reichs-Mus.Leiden (1), 3:122; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:409; 1911 Schepman, Siboga-Exped. 49d:312; 1915 Tesch in Wanner, Paleont.Timor 5:58, pl.81, gif.126; 1955 Marche-Marchad, J.Conchyl. 95:31.
1880. *Nassa thersites* var. *irus* v.Martens, Moll.Beitr.Meer.Mauritius & Seychellen p.243, pl.20, fig.10.
1887. *Nassa thersites* var. *acypha* v.Martens, J.Linn.Soc.Lond. 21:182, pl.16, figs.1a-c.
1895. *Nassa (Eione) thersites* (Bruguière), K.Martin, Samml.geol.Reichs-Mus.Leiden 1:111, pl.18, figs.256,256a.
1895. *Nassa (Eione) sondeiana* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S. 1:112, pl.18, figs.257,257a; 1919 K.Martin, Palaeozool.Kennt.Java, p.84.
1922. *Arcularia thersites* (Bruguière), Hornell, Madras Fish.Bull. 14:214.
1942. *Nassarius thersites* (Bruguière), Yen, Proc.Malac.Soc.Lond. 24:231; 1957 Kaicher, Indo-Pacif.sea shells pl.7, fig.6.
1950. *Nassarius (Plicarcularia) thersites* (Bruguière), Beets, Leidse Geol. Meded. 15:294; 1961 Rippingale & McMichael, Queensld. & Gt.Barrier reef shells p.105, pl.13, fig.22.
1957. *Nassarius jonasi* Dunker, Demond, Pacific Science, 11:320, fig.21 (non Buccinum jonasii Dunker, 1846).
1961. *Plicarcularia thersites* (Bruguière), Habe, Col.Illust.shells Japan 2:63, pl.32, fig.7; 1971 Wilson & Gillett, Austral.shells p.102, pl.66, figs.9,9a,b.
1964. *Arcularia (Plicarcularia) thersites* (Bruguière), Habe, Shells west. Pacific col. 2:98, pl.32, fig.7.
1972. *Nassarius (Plicarcularia) pullus* (Linnaeus), Cernohorsky, Rec.Auckland Inst.Mus. 9:131, figs.10-12 (shell), fig.24 (radula).
1982. *Nassarius pullus* (Linne), Kaicher, Card cat.world-wide shells, Pack No.31:card 3205.

Shell up to 25.0 mm in length, elongate-ovate, solid, teleoconch of 7-7½ convex whorls, upper spire whorls subangulate, protoconch of 2¼-2½ glassy, yellowish-brown embryonic whorls; spire whorls sculptured with coarse axial ribs, ribs continuous to body whorl or obsolete, spiral sculpture consisting of grooves or spiral cords, spirals usually obsolete but occasionally produced especially anterior to spire-whorl sutures, base of body whorl with 4-5 somewhat granulose cords, dorsum with a prominent hump which may become obsolete. Aperture narrow, prominently denticulate-lirate, columella denticulate anteriorly, columellar callus large, shining, usually extending to penultimate whorl, but in some individuals shorter or longer. Siphonal notch very deep. Variable in colour, brown, grey or greenish-yellow, occasionally with a narrow pale central line, columella callus cream to pale orange, area above the parietal denticle frequently brownish, interior of aperture dark brown, dorsal hump frequently darker on pale specimens. Operculum brown, ragged at margins.

TYPE LOCALITY. Mediterranean = error! *(pullus)*; Asiatic Ocean *(thersites)*; Masbate, Philippines *(dorsuosa)*; Ascension I = Ponape, Caroline Is *(gracilis)*; Mauritius *(irus)*; Mergui Archipelago *(acypha)*; Sondé beds, Gendingan district, Java, Pliocene of Indonesia *(sondeiana)*.

DISTRIBUTION. From Mauritius to India, Japan and New Caledonia. Intertidal, in muddy sand and among mangroves.

Type specimens. The probable holotype of *N.pullus* (Linnaeus), is in the collection of the Linnean Society, London; the specimen has the number "458" of the 12th edition "Systema Naturae" on the callus-shield and measures length 22.0 mm, width 13.4 mm. The type of *Buccinum thersites* is no longer extant, and fig.413 on plate 41 from Martini (1773), vol.2, is designated as the illustrated lectotype (pl.3, fig.3). Two syntypes of *Nassa dorsuosa* A. Adams, are in the British Museum (N.H.), London, No.197335, and the 15.5 mm long syntype is here designated as the lectotype (pl.3, fig.2). The holotype of *N.thersites* var. *irus* v.Martens, length 17.3 mm, and *N.thersites* var. *acypha* v.Martens, length 17.0 mm, are both in the Zoological Museum, Humboldt University, Berlin. The type of *N.sondeiana* K.Martin, is in the Rijksmuseum van Geologie en Mineralogie, Leiden, and the type of *N.gracilis* Pease, appears to be lost.

Material examined. MAURITIUS: (coll.Marrow); MALDIVE IS: (ZSI); INDIA: N. of Goa (USNM); SRI LANKA: (USNM); BURMA: Tavoy coast (USNM); THAILAND: Koh Chang; E. side of Ko Phuket (both ZMC); Ao Nam Bor (coll.Wong); Koh Maprao; Koh Chang; Koh Samui (all USNM); Surachai, Gulf of Thailand (coll. Orr); MALAYSIA: Alligator I, N. of Singapore (coll.Powell); Singapore (SDNHM; USNM); Tanjong Rhu, Kedah (coll.Richardson); Pulau Langkawi, Kedah (coll. McCausland); INDONESIA: Pasir Putih near Panjang, Lampung province, Sumatra; Balikpapan, E.Laimantan, Borneo; Kupang, W.Timor; between Palu and Donggala, Sulawesi; Pantai Pura, N.of Kupang, W.Timor; Kalahabi Harbour, Alor I, N.of Timor; N.E. of Bangka I, Sumatra; Pasir Putih (all coll. McCausland); Labuan, N.Borneo; Marudu Bay, N.Borneo; Sandakan, N.Borneo (all USNM); off mouth of Mahakan River, E.Borneo (AMS); PHILIPPINES: Cebu (ZMC); Santa Margarita, Samar; near Cebu City, Cebu; Misamis Pt., Mindanao; Tilig, Lubang; Quezon (all USNM); Hoilo (LACM); Panay I (coll.Dan); CHINA: Hongkong (BMNH; USNM); Tai Tan Harbour, New Territories; Lantao I, Shiu Hao (all coll.Morton); China Seas; Hianan (both USNM); Tolo Harbour, Hongkong (coll.Orr); Tung Fuk, Lantow I, Hongkong (AMS); TAIWAN: (USNM); Takao (SDNHM); RYUKYU IS: Seragaki, Okinawa I (coll.Deynzer); JAPAN: Nagasaki (USNM); CAROLINE IS: Yap I (USNM); WEST IRIAN: Soendidori Bay, Soepiori, Schouten Is (coll.Powell); PAPUA NEW GUINEA: Hood's Bay (USNM); Nui I, Madang Harbour; Hermit group (both AMS); Samarai (NMV); AUSTRALIA: Queensland: Magnetic I: Pt.Martin; Green I (all AIM); Lucinda Pt. (coll.Powell); Port Denison (NZGS); Cooya Beach, N.of Port Douglas (coll.Gardner); Four mile reef; Langford reef (both AIM); Port Curtis; Adelaide creek, Port Dennison (both USNM); Townsville; Yeppoon; Wynnum, Moreton Bay (all LACM); Cairns Harbour; Bowen; off Peel I, Moreton Bay; Tin Can Bay, N. of Gympie; Pancake creek, Bustard I; Scarborough; Bundaberg; Facing I; Buchan's Pt., N.of Cairns; Urangan area, Hervey Bay; Nellies Beach, Proserpine; Mackay; Lindeman I; Heron I; Cape Flattery near Cooktown; Palm I, N.of Cooktown; Port Curtis; Hagerstone; Thursday I, Torres Str. (all AMS); Dundowran; Orpheus I; Bowen; Brampton I; Redcliff; Yule Pt., Cairns (all NMV); Clontarf beach (coll.Hoskings); SOLOMON IS: Komimbo Bay, Guadacanal (Auckland Univ.); NEW HEBRIDES: Surinda, Espiritu Santo (coll.Cole); NEW CALEDONIA: Houailou, East coast (coll.Taylor).

Fossil record. PLIOCENE: Kampong Fatoekau, Fialarang, Timor, Indonesia (Tesch in Wanner 1915); Mandul I, E.Borneo, Indonesia (Beets 1950); Akelamo valley, Obi I, Timor (Fischer in Wanner 1927).

The sculpture and development of the columellar callus are variable features. The following forms have been described:

Typical form *pullus* Linnaeus: the axial ribs extend partly on to the body whorl and the dorsal hump is distinct. *N.thersites* (Bruguière) and *N.gracilis* (Pease) are the same form.

Forma *dorsuosa* A. Adams: the columellar callus almost reaches the apex and the dorsal hump is very prominent.

Forma *irus* v.Martens: the axial sculpture is obsolete on the body whorl, dorsal hump is almost absent, the callus-shield is short and has a "V"-shaped notch. *N.sondeiana* K.Martin, is the same form.

Forma *acypha* v.Martens: axially ribbed on body whorl and the dorsal hump is greatly reduced.

Nassarius (Plicarcularia) leptospirus (A. Adams, 1852)
(Plate 3, figs.10-12)

1852. *Nassa (Eione) leptospira* A. Adams, Proc.Zool.Soc.Lond. p.103.
1853. *Nassa leptospira* A. Adams, Reeve, Conch.Icon. 8:pl.13,fig.84; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43; 1934 Mari, J.Conchyl. 78:33.
1898. *Nassa (Arcularia) leptospira* (A. Adams), Melvill & Standen, J.Conch. 9:41; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:409; 1911 Schepman, Siboga-Exped. 49d:313; 1955 Marche-Marchad, J.Conchyl. 95:30.

1966. *? Plicarcularia bellula* (A. Adams), Habe & Kosuge, Shell world col. 2:60, pl.22, figs.7,8.

Shell up to 17.0 mm in length but frequently smaller, *c.*10.0 mm on average, teleoconch of 4½-5½ convex whorls, protoconch of 1½-1¾ smooth embryonic whorls, whorls subangulate at sutures; sculptured with regular, slender axial ribs which continue to the back of the outer lip on body whorl, and bisecting spiral grooves or threads, *c.* 10 spiral threads on lower half of the body whorl more prominent, sutures with a distinct row of nodules. Aperture narrow, denticulate, columellar callus large and shining and barely reaching or slightly overlapping body whorl suture. Cream, grey or brown in colour, body whorl occasionally with a narrow pale line, columellar callus white to yellow, aperture brown within.

TYPE LOCALITY. Ilo Ilo, Panay I, Philippines.

DISTRIBUTION. From Pakistan to Indonesia, the Philippines and New Caledonia. From the intertidal zone to a depth of 13 m.

Type specimens. Two syntypes of *N.leptospirus* (A. Adams) are in the British Museum (N.H.), London, No. 197347, and the 16.7mm long syntype is here selected as the lectotype (pl.3, figs.10,11).

Material examined. PAKISTAN: Karachi (USNM); INDONESIA: Keledjitan, Bantam, Java; Tomahu I, Moluccas (both USNM); PHILIPPINES: Cliff I, Palawan group, 13 m (USNM); AUSTRALIA: Goode I, near Thursday I, Torres Str. (NSMT); Thursday I, Torres Str. (coll.Ritter); Port Darwin, Northern Territory (NMV); Lindeman I, Queensland (AIM); NEW CALEDONIA: (USNM).

The species is similar to *N.pullus* (Linnaeus), but differs in being smaller in size with a finer sculpture of slender axial riblets which persist to the outer lip of the body whorl, absence of a dorsal hump, fewer denticles on the outer lip and a paucispiral protoconch of 1½ embryonic whorls.

Nassarius (Plicarcularia) bellulus (A. Adams, 1852)
(Plate 3, fig. 13; Plate 4, figs. 1, 2)

1852. *Nassa (Eione) bellula* A. Adams, Proc.Zool.Soc.Lond. p.102.
1852. *Nassa (Eione) nana* A. Adams, Proc.Zool.Soc.Lond. p.102.
1853. *Nassa nana* A. Adams, Reeve, Conch.Icon. 8:pl.25,fig.164; 1874 Tapparone-Canefri, Mem.R.Accad.Sci.Torino, (2), 28:121; 1934 Mari, J.Conchyl. 78:38.
1854. *Nassa bellula* A. Adams, Reeve, Conch.Icon. 8:pl.28,fig,184; 1934 Mari, J.Conchyl. 78:35.
1877. *Nassa (Arcularia) nana* (A. Adams), Brazier, Proc.Linn.Soc.N.S.W. 1:180; 1955 Marche-Marchad, J.Conchyl. 95:31.
1946. *Nassarius (Plicarcularia) bellulus* (A. Adams), Habe, Venus:Jap.J.Malac. 14:193, textfig.20 (radula).

Shell *c.*12.0 mm in length, moderately light in weight, elongate-ovate, teleoconch of 4¾-5½ angulate whorls, protoconch of 2¾-3 embryonic whorls; sculptured with thin, angulate axial ribs which number from 12-16 on the penultimate and from 13-16 on the body whorl, sutures of spire whorls with a row of prominent, slightly echinate nodules, suture of body whorl and occasionally penultimate whorl with a double row of nodules. Spiral sculpture consists of spiral threads which number from 3-4 on the penultimate and from 8-10 on the body whorl, siphonal fasciole with an angulate cord. Aperture narrow, outer lip narrowly variced and with 8-10 denticles, columella with 3-5 denticles and an oblique fold anteriorly, columellar callus large and reaching body whorl suture, slightly thinning above parietal wall. Creamy-white to straw-yellow in colour, body whorl with 2-3 narrow brown bands on body whorl, callus-shield white.

TYPE LOCALITY. Catbalonga, Samar I, Philippines *(bellulus);* Dumaguete, Negros I, Philippines *(nana).*

DISTRIBUTION. From India to Indonesia and the Philippines. In sand, usually subtidal, to a depth of 100 m.

Type specimens. Two syntypes of *N.bellulus* (A. Adams) are in the British Museum (N.H.), London, No.197316, and the 10.0 mm long syntype is here selected as the lectotype (Pl.3, fig. 13). Two syntypes of *Nassa nana* A. Adams, are in the same Institution, No.1973133, and the 8.2 mm long specimen is here designated as the lectotype (Pl.4,fig.2).

Material examined. INDIA: Pondicherry (ZSI); MALAYSIA: Pulau Langkawi, Kedah (coll.McCausland); THAILAND: Koh Kut (ZMC); PHILIPPINES: Samar I and Negros I (BMNH); Sth. of Puerto Princessa, Palawan group (coll.Norton).

The species is similar to *N.leptospirus* A. Adams, but differs in features of angulate whorls, multispiral protoconch, double row of sutural nodules on last 2 whorls and wider spaced spiral threads.

Nassarius (Plicarcularia) elegantissimus Shuto, 1969 [nom. praeocc.]
(Plate 4, figs. 3-5)

1969. *Nassarius (Chelenassa) elegantissimus* Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19:142, pl.13,figs.1-10, 13,14, 19-21; textfigs.27,28 (non *Buccinum elegantissimum* Risso, 1826 = *Nassarius*).

Shell up to 15.0 mm in length but sometimes only half this size, similar to *N.bellulus* (A. Adams), but sculptured with very numerous, thin, close-set axial ribs which number from 25-50 on the penultimate and somewhat less on the body whorl; axials are bisected by spiral striae which produce small fillets arranged in 5-6 spiral rows on the penultimate and up to 20 rows on the body whorl, spiral rows of granules on spire whorls either equal-sized or the 2 posterior sutural rows slightly more prominent. Apertural features and columellar callus as in either *N.pullus* (Linnaeus) or *N.bellulus* (A. Adams). Brown to bluish-grey in colour, spire whorls with a single white or cream-coloured band, body whorl with a peripheral band of the same colour, columellar callus white or cream. Operculum brown, finely or coarsely serrate at margins, some specimens with only a single denticle on either side.

TYPE LOCALITY. Santa Barbara silt, Panay I, Late Pliocene of the Philippines.

DISTRIBUTION. From Malaysia to the Philippines. Intertidal, on fringing reefs and in mangrove swamps.

Type specimens. The holotype of *N.elegantissimus* Shuto, is in the Kyushyu University, Geology coll. No. GK-L 6565, length 10.2 mm.

Material examined. MALAYSIA: Batu Ferringhi, Penang (coll.McCausland); INDONESIA: Pantai Pura, N.of Kupang, W.Timor; Nusa Tenggara, Timor (both coll.McCausland); Telok Assam, Sarawak, Borneo (coll.Richardson); PHILIPPINES: Ilo Ilo, Panay I (coll.Norton).

It is possible that *N.elegantissimus* Shuto, may prove to be a form of *N.bellulus* (A. Adams), and some individuals closely resemble this species. For this reason, no substitute name has been proposed for the homonymous *N.elegantissimus* Shuto, but authors who consider this species to be congeneric with *Nassarius s.str.* must reject the taxon as a secondary homonym of *Buccinum elegantissimum* Risso, 1826, which is a *Nassarius s.str.*

Nassarius (Plicarcularia) bimaculosus (A. Adams, 1852)
(Plate 4, figs. 6,7)

1852. *Nassa (Eione) bimaculosa* A. Adams, Proc.Zool.Soc.Lond. p.102.
1853. *Nassa bimaculosa* A. Adams, Reeve, Conch.Icon. 8:pl.10, fig.61.
1879. *Nassa (Arcularia) bimaculosa* A. Adams, E.A.Smith, Proc.Zool.Soc.Lond. p.810; 1898 Melvill & Sykes, Proc.Malac.Soc.Lond. 3:37; 1911 Schepman, Siboga-Exped. 49d:312; 1938 Adam & Leloup, Mem.Mus.R.d'Hist.Nat.Belg. 2:182, pl.8,figs.5a,b.
1901. *Nassa (Arcularia) thersites* var. *bimaculosa* A. Ad, Melvill & Standen, Proc.Zool.Soc.Lond. 2:409.
1928. *Nassarius (Arcularia) thersites* var. *bimaculosa* A.Ad., Melvill, Proc. Malac. Soc.Lond. 18:106.
1930. *Nassarius (Arcularia) bimaculosus* var. *minima* Bisacchi, Ann.Mus.Civ.Stor. Nat.Genova 55:56 (non Tournouer, 1876).
1934. *Nassa thersites* var. *bimaculosa* A.Ad., Mari, J.Conchyl. 78:34.
1942. *Nassarius bimaculosus* A.Ad., Yen, Proc.Malac.Soc.Lond. 24:231.
1966. *Plicarcularia bimaculosa* A.Ad., Habe & Kosuge, Shells world col. 2:61, pl.22, figs.20,21.
1972. *Nassarius (Plicarcularia) bimaculosus* (A. Adams), Cernohorsky, Rec. Auckland Inst.Mus. 9:133, fig.13 (shell), fig.23 (radula); 1978 Cernohorsky, Trop.Pacific Mar.shells p.79, pl.24,fig.2.

Similar to *N.pullus* (Linnaeus) and only slightly smaller in size, but differing in the following features: protoconch of 3-3¼ glassy-fawn embryonic whorls, last whorl carinate, squatter and broader in shape, axial ribs on body whorl wider apart and interrupted anterior to the sutures by a shallow channel giving rise to small sutural nodules; interspaces smooth, lacking the impressed grooves of *N.pullus*. Columellar callus more orbicular and not pointed anteriorly and always white in colour; dorsal hump smaller and more knob-like and the dark brown blotch present in *pullus* is absent. Greenish-grey to bluish-grey in colour, ornamented with a narrow white subsutural band and a darker central band on the body whorl; the back of the outer lip usually with 2 dark brown spots, but some individuals uniformly cream or dark brown in colour. Operculum yellowish-brown, minutely serrate on right margin.

TYPE LOCALITY. Siquijor I, Philippines.

DISTRIBUTION. From Sri Lanka to China, N.Australia and the Solomon Is. In sand, in the intertidal zone.

Type specimens. Three syntypes of *N.bimaculosus* (A. Adams) are in the British Museum (N.H.), London, No. 197317, and the 16.3 mm long syntype is here selected as the lectotype (Pl.4,fig.6).

Material examined. SRI LANKA: (LACM); ANDAMAN IS: (ZSI); NICOBAR IS: Little Nicobar I (ZMC); MALAYSIA: Singapore (LACM); INDONESIA: Bali (AMS); Kupang, W.Timor; between Pulau and Donggala, Sulawesi; Sunur Beach, Bali; Nusa Tenggara; Pantai Pura, N.of Kupang, W.Timor; Pantai Kelapa Lima, 5 km N. pf Kupang, W. Timor (all coll.McCausland); PHILIPPINES: Marinduque (AIM); Puerto Galera, Mindanao (ZMC); off Luzon; E.coast of Polillo; Puerto Princessa, Palawan group; Siquijor; Tajabas province, Luzon; Negros; Santa Maria, Mindanao; Manila; Cebu; San Vincente harbour, Luzon (all USNM); Miriveles, Bataan (LACM); Batangas Bay (AMS); Matnog I (SDMNH); CHINA: (BMNH); WEST IRIAN: E. of Paipoeri, Koeroedoi I, Geelvink Bay (AMS); PAPUA NEW GUINEA: Rabarua,E.New Britain; Kimbe (both coll.Parkinson); AUSTRALIA: Thursday I, Torres Str. (ZMC); Goode I near Thursday I, 3m (NSMT); SOLOMON IS: Gihili, Bougainville (AMS).

Nassarius (Plicarcularia) eniwetokensis Ladd, 1977
(Fig. 104)

1977. *Nassarius (Arcularius) eniwetokensis* Ladd, Geol.Surv.Prof.Pap. 533:52, pl.17,figs.14,15.

Shell *c.* 8.0 mm in length, similar in outline to *N.bimaculosus* (A.Adams), but differs in having stronger axial ribs on body whorl and a prominent spiral sculpture of 14-15 cords on the body whorl; the varix on the back of the outer lip is prominent and grooved, with the extensions of the spiral cords ascending the wall of the varix. Columellar shield of a similar size as in *N.bimaculosus*, anal and siphonal canals prominent, outer lip with 10-11 plicae, columella strongly lirate.

TYPE LOCALITY. Drill hole at Enewetak Atoll, Marshall Is, Late Miocene.

DISTRIBUTION. Known only from the Late Miocene of the Marshall Islands.

Type specimens. The holotype of *N.eniwetokensis* Ladd, is in the National Museum of Natural History, Washington, No. USNM-175039, length 8.0 mm, width 6.0 mm.

Nassarius (Plicarcularia) camelus (v. Martens, 1897)
(Plate 4, figs.8,9)

1880. *Nassa bimaculosa* var. *immersa* "Carpenter", Marrat, Var.shells genus *Nassa*, p.74 (nomen nudum).
1882. *Nassa (— —) immersa* "Carp. Marrat", Tryon, Man.Conch. 4:220, (publ. in synonymy of *N.bimaculosa* A. Adams, and refers to Marrat, var.1249) [nomen nudum].
1889. *Nassa immersa* "Carpenter", Brazier, J.Conch. 6:66 (nomen nudum).
1897. *Nassa camelus* v.Martens, Arch.f.Naturg. 63:173, pl.16, figs.15-17; 1934 Mari, J.Conchyl. 78:32.
1898. *Nassa (Arcularia) immersa* "Carpenter", Melvill & Sykes, Proc.Malac.Soc.Lond. 3:37 (nomen nudum).
1911. *Nassa (Arcularia) immersa* Schepman, Siboga-Exped. 49d:313 (first valid description).
1978. *Nassarius (Plicarcularia) camelus* (v.Martens), Cernohorsky, Trop. Pacific Mar.shells p.80, pl.24, fig.3.

Shell up to 11.0 mm in length but frequently smaller, ovoid, most of shell submerged in callus, sculptured with a few, often wide-spaced, arthritic axial ribs, interspaces smooth or with obsolete macroscopic spiral striae, dorsal hump knob-like and always prominent. Aperture narrow, outer lip denticulate-lirate and descending almost vertically, columellar callus very large and reaching apex, columella with 5-8 denticles, parietal denticle prominent and vertical, callus occasionally thinning next to denticle. Creamy-white to pale yellowish-orange, penultimate whorl with 2 greenish-brown, narrow bands, body whorl with 3 small bands, back of outer lip with 1-2 small spots, interior of aperture banded dark brown.

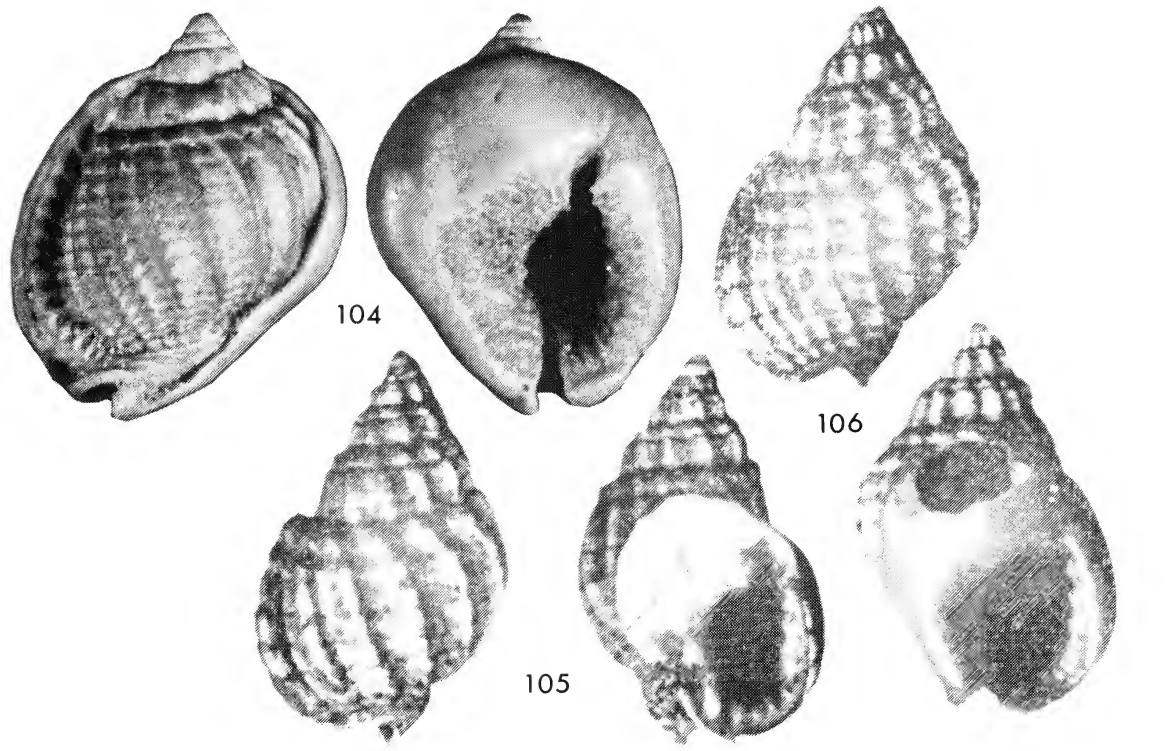
The animal has 2 metapodial tentacles, a black speckled foot and mantle which extends over the shell during activity, a pale brown siphon, and eyes are present. The species is a scavenger deposit feeder (J.Gwyther, *in litt.*)

TYPE LOCALITY. Blanche Bay, New Britain, Papua New Guinea *(camelus)*; near N. point of Nuhu Jaan, Kai Is, Indonesia *(immersa)*.

DISTRIBUTION. From India to Indonesia, Philippines and the New Hebrides. In silt, sand, mud and weed, usually intertidal.

Type specimens. Syntypes of *N.camelus* (v.Martens), are in the Zoological Museum, Humboldt University, Berlin, length of illustrated syntype 9.6 mm (pl.4, fig.8). The type of *N.immersa* Schepman, is in the Zoological Museum, Amsterdam.

Material examined. INDIA: Vizagapatam (BMNH); ANDAMAN IS: (ZSI; SDNHM); NICOBAR IS: (ZMC; SDNHM); INDONESIA: Between Palu and Donggala, Sulawesi (coll. McCausland); Batavia, Java (coll. van Heusen); PHILIPPINES: Cebu (coll. WOC); Alabat I (USNM); WEST IRIAN: Aoe I, Geelvink Bay (USNM); N.E. Ambi I, Japen I, Schouten group (AIM); PAPUA NEW GUINEA: Duke of York I, New Britain; New Ireland; Jacquinot Bay, Pomio district, E. New Britain (coll. Gwyther); Rabaul, New Britain (coll. Hoeter); Kavieng (coll. Kleckham); SOLOMON IS: River mouth, Morova lagoon (coll. Lee); NEW HEBRIDES: Santo I (coll. Marrow).



Figs. 104-106. Fossil Nassariinae. 104. *Nassarius (Plicarcularia) eniwetokensis* Ladd. Holotype USNM-175039; 8.0 mm. 105. *N. (P.) mandirensis* Oostingh, Holotype; 7.2 mm. 106. *N. (P.) rubusindicus* Oostingh. Holotype; 8.4 mm (both after Oostingh, 1939).

The name *"Nassa immersa* Carpenter" has remained a manuscript named for many years until its validation by Schepman (1911).

Gwyther, Painap and Gwyther (1980) reported on the ecology of the species and its usage as "tambu" shell money by people in East New Britain, Papua New Guinea. It is interesting to note that a bride-price payment will demand 100 metres of "tambu", and assuming the average width of a specimen to be 5.5 mm, the 100 m long, rolled-up "tambu" coils will consist of approximately 18,000 specimens.

Nassarius (Plicarcularia) callospira (A. Adams, 1852)
(Plate 5, figs.1,2)

1852. *Nassa (Eione) callospira* A. Adams, Proc.Zool.Soc.Lond. p.102.
1853. *Nassa callospira* A. Adams, Reeve, Conch.Icon. 8:pl.10, figs.66a,b; 1876 E.A.Smith, J.Linn.Soc.Lond. 12:546; 1895 Melvill & Standen, J.Conch. 8:107; 1934 Mari, J.Conchyl. 78:36.
1874. *Nassa (Arcularia) callospira* A. Adams, G. & H. Nevill, J.Asiatic Soc. Bengal 43(2):25, pl.1, fig.5; 1879 E.A. Smith, Proc.Zool.Soc.Lond. p.810; 1938 Adam & Leloup, Mem.Mus,R.d'Hist.Nat.Belg. 2:183, pl.8, figs.6a,b.
1972. *Nassarius (Plicarcularia) callospira* (A. Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:135, fig.14 (shell), fig.25 (radula).
1982. *Nassarius callospira* (A. Adams), Kaicher, Card cat.world-wide shells, Pack No.31: card 3151.

Shell up to 14.0mm in length, elongate-ovate, teleoconch of 4-5 whorls, protoconch of 3-3¼ finely carinate embryonic whorls, protoconch occasionally imbedded in callus-shield; sculptured with thick and broad axial ribs which become thinner and more numerous on body whorl; spiral sculpture of bisecting spiral threads which render axial ribs granulose, dorsal area of body whorl with a hump, deeper subsutural groove separating sutural nodules. Aperture narrow, outer lip and base of columella denticulate, columellar shield large, glossy, and occasionally reaching apex, siphonal and anal canals distinct. White to cream in colour, spire whorls with a single dark green subsutural band, body whorl with 1-3 bands, columellar shield white but frequently flushed with orange above parietal wall, interior of aperture banded with purple-brown, occasional specimens uniformly cream in colour. Operculum brown and serrate at the margins.

TYPE LOCALITY. Burias I, Philippines, 11 m.

DISTRIBUTION. From East Africa to the Andaman Is, Philippines and the Samoa Is.

Type specimens. Three syntypes of *N.callospira* (A. Adams) are in the British Museum (N.H.), London, No. 197319, and the 11.6 mm long syntype is here selected as the lectotype (pl.5, fig.1).

Material examined. EAST AFRICA: Zanzibar (USNM); MADAGASCAR: Tulear (SMOM); REUNION IS: St. Giles (coll.Martin); ANDAMAN IS: (ZMC; ZSI; USNM); Port Blair (NM); INDONESIA: Standing I, Mentawai I; Morotai, Halmahera (both USNM); Kupang, W. Timor; Sanur Beach, Bali; Mali, Alor I, Timor; Pantai Kelapa Lima, 5 km N. of Kupang, W. Timor; Nusa Tenggara, Timor (all coll.McCausland); PHILIPPINES: Torrojos, Marinduque I (USNM); PAPUA NEW GUINEA: Port Moresby; Panab I, Madang; Nui I, Madang Harbour (all AMS); Rabaul, New Britain (coll.Prior); Raluana village, E. New Britain, 24 m (coll.Parkinson); Laing I, Hansa Bay (coll.Tursch); AUSTRALIA: Michaelmas Cay, off Cairns, Qld. (AMS); SOLOMON IS: Kieta, Bougainville (coll.Whitehead); Haroro; Komimbo Bay and Marau Sound, Guadalcanal; Jetty reef, Guadalcanal (all Auckland Univ.); Ugi I (USNM); Hetabeta I, Santa Isabel group (coll.Bratcher); Gihili, Bougainville (AMS); NEW HEBRIDES: Tuki Tuki Pt., Efate I; Port Havannah, N. Efate I; Malapoa Pt., Efate I; (all coll.Eker); Surunda, Espiritu Santo (coll.Coles); Undine Bay, Efate I (coll.Bratcher); LOYALTY IS: Lifu I (AMS; AIM; USNM); NEW CALEDONIA: (AMS); TONGA IS: Va'vau (SDNHM); SAMOA IS: Apia (coll.Powell).

In specimens from the Andaman Is, the callus-shield is smaller and frequently reaches only the body whorl suture. In the New Hebrides, the species is frequently found in colonies.

Nassarius (Plicarcularia) mandirensis Oostingh, 1939
(Fig.105)

1939. *Nassarius (Plicarcularia) mandirensis* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):170, pl.15, figs.264a,b; 265,266.

The species is similar to *N.rubusindicus* Oostingh, and differs only in fewer, more slanting and angulate axial ribs, more prominent sutural nodules, and a smaller callus-shield which barely reaches the body whorl suture and does not cover the siphonal fasciole as in *N.rubusindicus.*

TYPE LOCALITY. Tjikondang, S.Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The holotype is probably in the Bandoeng Museum, Indonesia, length 7.2 mm, width 4.6 mm.

Nassarius (Plicarcularia) rubusindicus Oostingh, 1939
(Fig. 106)

1939. *Nassarius (Plicarcularia) rubus-indicus* Oostingh, Ing.Ned.-Indie Mijnb. Geol. 6(12): 171, pl.15, figs.267a,b.

Shell 8.0 in length, similar to *N.callospira* (A. Adams), a teleconch of 4 whorls, protoconch mising, sculptured with axial ribs which number 15 on the penultimate and 17 on the body whorl, interspaces narrow, spiral sculpture consisting of bisecting threads which number 3 on the penultimate and 8 on the body whorl. Apeture narrow, outer lip strongly denticulate, orbicular callus-shield reaching body whorl suture. Traces of 4 paler transverse bands present.

TYPE LOCALITY. Tjimantjak-hilir, Tjimantjeuri, S.Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The holotype of *N.rubusindicus* Oostingh, is probably in the Bandoeng Museum, Indonesia, length 8.4mm, width 5.6mm.

Nassarius (Plicarcularia) persicus (v.Martens, 1874)
(Plate 5, figs.3-6)

1874. *Nassa persica* v.Martens, Novit.Conch.Suppl. 5:94, pl.5, fig.47.

Shell up to 21.0 mm in length, light in weight, elongate-ovate, teleoconch of 6½-7¼ weakly convex whorls which are angulate at sutures and protoconch of 3 glassy-white embryonic whorls; sculptured with strong axial ribs which are weakly constricted at sutures to form faint nodes, ribs numbering from 12-14 on the penultimate and from 12-19 on the body whorl, ribs becoming partially obsolete in centre of body whorl; spiral sculpture consists of short, almost obsolete grooves in interspaces on spire whorls and very weak spiral striae on body whorl, 3-4 basal spiral threads more prominent, siphonal fasciole with 4-5 oblique cords. Aperture narrow, outer lip with 7-8 denticles, columellar shield large and extending to body whorl suture, base of columella with 1 strong plication and 5-8 smaller denticles, siphonal and anal canals distinct. Cream, straw-yellow or pale grey in colour, occasionally with a nebulous darker band, callus-shield white, interior of aperture with 3 brown bands, periostracum thin, straw-yellow in colour. Operculum brown, margins serrate.

TYPE LOCALITY. Persian Gulf.

DISTRIBUTION. From the Persian Gulf to Pakistan. Intertidal.

Type specimens. The holotype of *N.persicus* (v.Martens) is in the Zoological Museum, Humboldt University, Berlin, length 20.8 mm.

Material examined. PERSIAN GULF: Ras Mishab (USNM); Tarrut Bay, Arabia; Al Manamah, Bagrain, 26°12'N & 50°38'E (both AMS); Saihat, Saudi Arabia (coll.WOC); GULF OF OMAN: Mina al Fahal; Masirah I (both coll.Bosch); PAKISTAN: Karachi (coll.Steiner).

Nassarius (Plicarcularia) fissilabris (A. Adams, 1852)
(Plate 5, figs.7-10)

1852. *Nassa fissilabris* A. Adams, Proc.Zool.Soc.Lond. Pt.19:99; 1853 Reeve, Conch.Icon. 8: pl.21, fig.138; 1891 E.A.Smith, Proc.Zool.Soc.Lond. p.408; 1934 Mari, J.Conchyl. 78:14.
1901. *Nassa (Phrontis) fissilabris* (A. Adams), Melvill & Standen, Proc.Zool.Soc.Lond. 2:413.
1930. *Nassarius fissilabris* (A. Adams), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:46.

Shell up to 18.0 mm in length but frequently smaller, elongate-ovate, some specimens broader than others, teleoconch of 5-5¾ weakly convex to almost flat-sided whorls, protoconch of 1½ smooth, golden embryonic whorls; sculptured with coarse axial riblets and bisecting spiral grooves which number from 4-7 on the penultimate and from 9-10 on the body whorl apart from 3-4 nodulose spiral cords at base; on the body whorl spiral grooves give rise to flattish cords and the sutural nodules are sometimes bisected by a revolving spiral groove which produces a doubled sutural girdle. Aperture narrow, outer lip thickened and denticulate-lirate, columellar callus expanding and frequently reaching body whorl suture and usually thinning above parietal wall, lower half of columella denticulate, anal canal prominent and continuing almost through to the suture and bordered on left side by a prominent callosity, siphonal notch deep, siphonal fasciole recurved towards aperture. White to straw-yellow in colour, spire whorls with 2 brown bands which are either continuous or interrupted and forming spots in interspaces, body whorl with a continuous or interrupted central band and another similar band at sutures and base, band frequently visible only as brown spots in interspaces or on the wall of axial ribs, columellar callus porcellaneous white to yellowish with the brownish pattern of the body whorl appearing above parietal wall, aperture white, with 2-3 brown bands deep within, some individuals uniformly pale creamy-yellow. Operculum brown, and serrate at margins.

TYPE LOCALITY. Cagayan, Province of Misamis, Mindanao I, Philippines, 46 m = error?.

DISTRIBUTION. Apparently endemic to the Red Sea, Persian Gulf and Gulf of Oman. In coral sand, from the intertidal zone to a depth of 36 m.

Type specimens. Three worn syntypes of *N.fissilabris* (A. Adams), are in the British Museum (N.H.), London, No. 197336, and the specimen measuring length 10.6 mm, width 5.1 mm, is here selected as the lectotype (pl.5, fig.7).

Material examined. RED SEA: Dahlak Archipelago, 15°17'N & 40°10'E, 18-36 m (TAU); GULF OF OMAN: Mina Al Fahal, 16 km W. of Muscat (coll.Luther); Masirah I, Sohar, *c.* 240 km N.W. of Muscat (both coll.Bosch).

The type-locality of *N.fissilabris* is most probably erroneous. E.A. Smith (1891a) reported the species from Aden, Melvill & Standen (1901) from the Persian Gulf and the Mekran coast, and Bisacchi (1930) cites Red Sea localities of Massawa, Dahlak Archipelago, Hawakil I and Assab, and no specimens have been recorded outside the Red Sea – Gulf of Oman region.

The species is very variable in sculpture, some individuals having a few shallow spiral grooves while others are distinctly spirally striate. The syntypes of *N.fissilabris* are very worn, but in one syntype the spiral sculpture is more prominent than in the lectotype.

Nassarius (Plicarcularia) fraudulentus (Marrat, 1877)
(Plate 5, figs.11,12, plate 6, fig.1)

1852. *Nassa callosa* A. Adams, Proc.Zool.Soc.Lond. p.98; 1854 Reeve, Conch.Icon. 8:pl.28, figs.185a,b; 1934 Mari, J.Conchyl. 78:35 (non *Cassis callosa* Roeding, 1798 = *Nassarius (Plicarcularia)* sp.; nec *Buccinum callosum* Dujardin, 1837 = *Nassarius*).
1877. *Nassa (Arcularia) callosa* (A. Adams), Brazier, Proc.Linn.Soc.N.S.W. 1:179; 1898 Melvill & Sykes, Proc.Malac.Soc.Lond. 3:37; 1898 Melvill & Standen, J.Conch. 9:41.
1877. *Nassa fraudulenta* Marrat, Prop.new forms genus *Nassa*, p.8, pl.1, fig.24.
1972. *Nassarius (Plicarcularia) callosus* (A. Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:137, fig.30.
1978. *Nassarius (Plicarcularia) fraudulentus* (Marrat), Cernohorsky, Trop.Pacific Mar.shells p.80, pl.24, fig.4.

Shell up to 11.0 mm in length but frequently smaller, elongate-ovate but occasionally broad, teleoconch of 4½-5¼ convex whorls, protoconch of 2¼-2¾ glassy, embryonic whorls with the last whorl carinate; sculptured with slender axial ribs which are particularly numerous on spire whorls

and become reduced in number on the body whorl; spiral sculpture of very fine spiral striae, a subsutural groove which forms small sutural nodules and 3-4 corrugated cords on the base of the body whorl. Aperture narrow, outer lip with 5-7 denticles, columellar callus large, shining and reaching body whorl suture, columella with 3-7 denticles and a distinct parietal denticle. White, cream to fawn in colour, body whorl with 3 reddish-brown bands, spire whorls with a darker band across sutural nodules, callus-shield white to cream.

TYPE LOCALITY. Philippines *(fraudulentus)*; Bais, Negros I, Philippines, 13 m *(callosa)*.

DISTRIBUTION. From Mauritius to India, Philippines and the Society Is. In sand, from the intertidal zone to a depth of 25 m.

Type specimens. The types of *N.fraudulentus* (Marrat) are in the Merseyside County Museum, Liverpool, and consist of lots A, B, C. Two specimens each in lot A and B are *fraudulentus* as described and illustrated by the author, but lot C contains also *N.sinusigerus* (A. Adams, 1852). The syntype from lot B, length 9.7 mm, width 5.4 mm, is here designated as the lectotype of *N.fraudulentus* (pl.5, fig.11). The small, worn and holed holotype of *Nassa callosa* A. Adams, is in the British Museum (N.H.), London, No. 197318, length 6.3 mm. The British Museum also has 2 specimens labelled as "syntypes" of *"Nassa gwendolinae* Preston", which are this species. The epithet *"gwendolinae"* is a manuscript name since the species has not been described by Preston. This is another example of Preston's distribution of "types" in anticipation of a subsequent description which never eventuated.

Material examined. MAURITIUS: (AMS, SDNHM); N.W. of Black River, 16 m (coll.Powell); INDONESIA: Keledjitan, Bantam, Java (USNM); PHILIPPINES: Malampaya Sound, Palawan group, 9 m; Cliff I, Palawan group, 13 m (both USNM); AUSTRALIA: Yorkey's Knob, N. of C airns, Qld. (AIM); off Cape Flattery, Lizard I, Qld., 11-12 m (coll.Willan); Low Isles near Port Douglas, Qld., 25 m (coll.Ritter); FIJI IS: Lami, S. Viti Levu (coll.Marrow); Suva Harbour, 18°09'S & 178°24'E (ZMC); Main Suva ref, S.Viti Levu (coll.Northgrove); SOCIETY IS: Papara, Tahiti, 5 m; Mataiea, Tahiti, 12 m (coll.Trondle).

Nassa callosa A. Adams, 1852, is a secondary homonym of *Cassis callosa* Roeding, 1798, which is the species *Nassarius (Plicarcularia) gibbosulus* (Linnaeus).

Nassarius (Plicarcularia) maccauslandi sp. n.

(Plate 6, figs. 2-4)

Shell up to 7.0 mm in length, elongate-ovate, solid, teleoconch of 4-4½ convex whorls, protoconch of 3¾-4 glassy, finely carinate embryonic whorls; sculptured with angulate axial ribs which continue to the back of the outer lip, and number from 11-16 on the penultimate and from 12-18 on the body whor; spiral sculpture sparse and consisting of 2 overriding spiral cords which form the sutural girdle and from 4-6 basal cords on body whorl, remainder of shell smooth, siphonal fasciole with 5-6 oblique cords. Aperture narrow, outer lip thickened and prominently variced, interior with 6-8 denticles, columella with a spreading, highly glazed columellar callus which almost reaches body whorl suture in adult specimens, callus above parietal wall thinner and with the pattern showing through, lower half of columella with 4-6 denticles, siphonal notch and anal canal very deep. Grey in colour, sometimes with an underlying golden sheen, spire whorls ornamented with 2 brown to purple-brown spiral bands, body whorl with 3 bands of the same colour, siphonal fasciole and varix white and occasionally with 1 or 2 brown bands, lower body whorl band produces a large, purple-brown blotch on anterior end of outer lip; aperture white and brown-banded.

TYPE LOCALITY. Lami, Suva, south Viti Levu, Fiji Is. Intertidal, in muddy sand.

DISTRIBUTION. To date known only from the Fiji Is.

Holotype. In AIM No. TM-1369, length 6.9 mm, width 4.0 mm (pl.6, fig.2).

Paratypes. Numerous paratypes from the type-locality in collection O.K. McCausland, San Francisco; coll. M.Marrow, Frankston, Victoria; the Australian Museum, Sydney and the Auckland Institute and Museum.

Material examined. FIJI IS: Lami, Suva, Sth. Viti Levu (coll.McCausland; coll.Marrow).

The species has been confused with *N.fraudulentus* (Marrat), which it superficially resembles, but it differs from that species in the following characters: the more numerous embryonic whorls (2¼-2¾ in *fraudulentus* and 3¾-4 in *maccauslandi*), the two prominent sutural cords which form the sutural girdle, fewer, wider-spaced axial ribs on spire whorls, absence of an intervening spiral sculpture, and the thinner, highly glazed columellar callus. Almost all specimens of *N.maccauslandi* examined, had the broad purple-brown blotch on the anterior edge of the outer lip which continues as a band into the aperture.

The species has been named for Mr O.K.McCausland, San Francisco, who discovered the species in Fiji, and whose field-work in Indonesia has given us a better understanding of the molluscan fauna of that area.

Nassarius (Plicarcularia) kraussianus (Dunker, 1846)
(Plate 6, figs.5,6)

1846. *Buccinum kraussianum* Dunker, Zeit.f.Malakozool. 3:111; 1848 Krauss, Suedafrik. Mollusken p.123; 1858 Kuester, Syst.Conch.-Cab.Martini & Chemnitz 3(1A):28, pl.6,figs.19-21.
1848. *Nassa kuesteri* Krauss, Suedafrik.Mollusken p.123 (publ. in synonymy of *Buccinum kraussianum* Dunker, 1846).
1852. *Nassa (Eione) orbiculata* A. Adams, Proc.Zool.Soc.Lond. p.102.
1853. *Nassa orbiculata* A. Adams, Reeve, Conch.Icon. 8:pl.23, figs.154a,b.
1874. *Buccinum (Nassa) kraussianum* Dunker, v.Martens, Jahrb.deut.Malak. Gesell. 1:139.
1886. *Nassa kraussiana* Dunker, Sowerby, J.Conch. 5:4; 1892 Sowerby, Mar. shells Sth.Africa p.12; 1904 E.A.Smith, J.Malac. 11:23; 1959 Barnard, Ann.Sth.Afric.Mus. 45:119, fig.22k (radula), fig.23f (protoconch); 1973 Kensley, Sea-shells Sth.Africa p.160, fig.598.
1915. *Alectrion kraussiana* Dunker, Bartsch, U.S.Nat.Mus.Bull. No.91:52.
1928. *Nassarius kraussianus* (Dunker), Tomlin, Ann.Sth.Afric.Mus. 25(2):320,327; 1953 King, Trans.Geol.Soc.Sth.Africa 56:79.
1936. *Nassarius (?) kraussianus* (Dunker), Peile, Proc.Malac.Soc.Lond. 22:140, textfig. 4 (radula).

Shell up to 13.0 mm in length but frequently smaller, depressed, obliquely orbicular, protoconch of 1½ embryonic whorls; sculptured with a few axial ribs on spire whorls, body whorl smooth apart from a few axial growth-striae, 2-3 axial ribs on the back of the outer lip and 4-5 finely striate basal grooves, back of dorsum gibbous. Aperture small and edentulous, columellar shield very large with spire buried within callus. Brown, grey or greenish-brown, occasionally with a narrow pale central band, columellar callus cream to yellowish-orange and slightly thinning above parietal wall, interior of aperture dark brown with pale bands. Operculum brown and with 1-2 denticles on margins.

TYPE LOCALITY. Cape of Good Hope, South Africa *(kraussianus);* none *(orbiculata).*

DISTRIBUTION. From South Africa to Mozambique and Reunion I. On sandflats and among sea-plants and near river estuaries, intertidal.

Type specimens. The holotype of *N.kraussianus* (Dunker), is in the Zoological Museum, Humboldt University, Berlin, length 8.6 mm, and the holotype of *Nassa orbiculata* A. Adams, is in the British Museum (N.H.), London, No.1973132, length 9.0 mm.

Material examined. SOUTH AFRICA: Tongaat (coll.Powell); Jeffrey's Bay (AIM; USNM, SDNHM); Port Elizabeth (AIM; USNM); Port Alfred (USNM; SDNHM); Cape of Good Hope (USNM; SDNHM); Albany; Transkei Coast (both USNM); estuary of Knysna lagoon, The Cape (AMS); Algoa Bay (coll.Wiedeman); Durban, Natal (coll.Meyer); Durban, Natal; Congella, Natal (both USNM); Port Natal (SDNHM); MOZAMBIQUE: Inhaca I (coll.Meyer); REUNION I: St.Giles (coll.Martin).

This species has been believed to be confined to South Africa, but it has been recorded from Mozambique by Kensley (1973), and has also been collected on Inhaca I, Mozambique (*leg.* M.Meyer), and a living specimen has been taken in 1982 at St.Giles, Reunion I, by J.C. Martin.

Nassarius (Plicarcularia) globosus (Quoy & Gaimard, 1833)
(Plate 6, figs.7-10)

1833. *Buccinum globosum* Quoy & Gaimard, Voy.l'Astrolabe, Zool. 2:448, pl.32, figs.25-27.
1834. *Buccinum clathratum* Kiener, Spec.gen.icon.coq.viv. 9:101, pl.27,fig.108 (nom.subst.pro *B.globosum* Quoy & Gaimard, 1833) [non *B.clathratum* Born, 1778].
1853. *Nassa globosa* Quoy & Gaimard, Reeve, Conch.Icon. 8:pl.10, figs.62a,b; 1887 v.Martens, J.Linn.Soc.Lond. 21:183; 1931 van der Vlerk, Leidsche geol.Meded. 5:233; 1934 Mari, J.Conchyl. 78:33.
1870. *Niotha globosa* Q. & G., A. Adams, Ann.Mag.Nat.Hist. (4), 5:425.
1879. *Nassa (Arcularia) globosa* Quoy & Gaimard, E.A. Smith, Proc.Zool.Soc.Lond. p. 809; 1895 Melvill & Standen, J.Conch. 8:107; 1897 Melvill & Sykes, Proc.Malac.Soc.Lond. 2:169; 1911 Schepman, Siboga-Exped. 49d:313; 1916 Preston, Rec.Indian Mus.Calcutta 12:89; 1938 Adam & Leloup, Mem.Mus.R.d'Hist.Nat.Belg. 2:183.
1916. *Arcularia globosa* Q. & G., Hedley, J.R.Soc.W.Australia 1:61.
1930. *Nassarius (Arcularia) globosus* (Q. & G.), Bisacchi, Ann.Mus.Civ.Stor.Nat. Genora 55:56.
1933. *Nassa (Acicularia) globosa* Q. & G., Dautzenberg & Bouge, J. Conchyl. 77:213.
1957. *Nassarius globosus* Q.& G., Kaicher, Indo-Pacific Seashells pl.7,fig.23; 1961 Spry, Tanganyika Notes & Record No.56:23; 1982 Kaicher, Card cat.world-wide shells, Pack No.31:card 3161.
1966. *Plicarcularia globosa* Q.& G., Habe & Kosuge, Shells world col. 2:60, pl.22, figs.10,11.
1966. *Plicarcularia gibbosuloidea* Habe & Kosuge, Shells world col. 2:60, pl.22, figs. 5,6 (nomen nudum).

1966. *Plicarcularia gibbosuloidea* Habe & Kosuge, Venus: Jap.J.Malac. 24:317,331, pl.29, figs.2,3.
1972. *Nassarius (Plicarcularia) globosus* (Quoy & Gaimard), Cernohorsky, Rec.Auckland Inst. Mus. 9:136, figs.16-18 (shell), fig.22 (radula); 1977 Salisbury, Hawaiian Shell News 25 (2):5, fig.6.
1982. *Nassarius gibbosuloideus* (Habe & Kosuge), Kaicher Card cat.world-wide Shells, Pack No.31: card 3167.

Shell up to 18.0 mm in length, solid globose, teleoconch of 4½-6¼ convex whorls, protoconch of 2-2¼ glassy, embryonic whorls with last whorl carinate; variable in sculpture, spire whorls with axial riblets and bisecting spiral threads which form 4-7 rows of granules on penultimate whorl, body whorl either prominently sculptured with 14-21 rows of small granules, however, in some Melanesian populations some specimens are either only axially ribbed or spirally striate or may lack sculpture altogether on the back of the body whorl; the dorsal hump is either prominent or absent. Aperture small, outer lip with 8-10 lirate denticles, callus-shield large, shining and orbicular, obliquely slanted or moderately straight, base of columella with 2-6 denticles, anal and siphonal canals prominent. Variable in colour, but usually white, banded with brown especially on the dorsal side of the body whorl where the brown colour is darker and forms a laterally elongated blotch, some specimens all brown with only a minimum of white showing, rare examples uniformly creamy-white, callus-shield white to pale yellow. Operculum yellowish-brown, margins either simple or serrate.

TYPE LOCALITY. Carteret Harbour, New Ireland, Papua New Guinea *(globosus* and *clathratum)*; New Caledonia *(gibbosuloidea)*.

DISTRIBUTION. From the Red Sea to Japan and the Samoa Is. In clean, muddy and weedy sand, among algae and on sand-flats, intertidal, frequently occuring in colonies.

Type specimens. Thirteen syntypes of *N.globosus* (Quoy & Gaimard) are in the Museum National d'Historie Naturelle, Paris, and the syntype measuring length 12.9 mm, width 9.5 mm, is here selected as the lectotype (pl.6,fig.7). The holotype of *Plicarcularia gibbosuloidea* Habe & Kosuge, is in the National Science Museum, Tokyo, No. 38621, length 12.0 mm, width 9.7 mm.

Material examined. SRI LANKA: (USNM); ANDAMAN IS: (SDMNH; ZSI); NICOBAR IS: (ZSI); Nancowry (ZMC); THAILAND: E.side of Ko Phuket; Koh Sundarar Nua (both ZMC); Nai Yang and Ao Nam Bor, both Phuket; Rawai (all PMBC); Goh Phi Phi (USNM); MALAYSIA: Singapore (coll.Powell); S.of Pulau Langkawi, Kedah (coll.McCausland); INDONESIA: Amboina Bay, S.of Ceram I; Sumatra; Batavia, Java (all ZMC); Harrison hotel, Jakarta; Pasir Putih, near Pamjamg, Lampung province, Sumatra; Carita Beach, N.of Labuan, W.Java; Sanur Beach, Bali, Pantai Pura, N.of Kupang, W.Timor; between Palu and Donggala, Sulawesi; N.E. Enggano I, S.of S.E.Sumatra (all coll.McCausland); Labuan, Borneo; Marudu Bay, N.Borneo; Pulau Siburu, S.W.Sumatra (all USNM); Bali (AMS); Kotakinabalu, Tg Aru, Sabah (coll.Munro); PHILIPPINES: Cebu; Puerto Galera, Mindanao (both ZMC); near Cebu city, Cebu; Manila Bay; Tilig, Lubang; Alimango, Burias I; Rio Jordan, Guimaras; Romblon; Manila Harbour, Luzon; Bolalao, Palawan group; Mindanao (all USNM); Ilo Ilo, Panay; Awasan Bech, Quezon province, Luzon I (both A,S); Punta Engano, Mactan I, Cebu (coll.Deynzer); CHINA: Hongkong (ZMC); JAPAN: Hoilo (LACM); CAROLINE IS: N.Babelthuap, Palau Is (coll.Powell); Arakabesan I, near Koror I, Palau Is (coll.McCausland); WEST IRIAN: N.E.Ambai I, Japen I, Schouten Is (coll. Powell); near Hollandia (USNM); PAPUA NEW GUINEA: New Ireland (USNM); Rabaul, New Britain; Duke of York I, New Britain (both AMS); Kimbe, W.New Britain (coll.Parkinson); Madang (coll.Hoeter); AUSTRALIA: Moreton Bay, Qld. (coll.Powell); SOLOMON IS: Guadalcanal (AIM); Sandfly Passage, Marau Sound, Guadalcanal; Banika I, Russell group (both Auckland Univ.); Tulagi I, Florida group (coll.Hallinan); Treasury I (coll.Gardner); Wagina I, Choiseul I; Ata I (both AMS); NEW HEBRIDES: Port Havannah, N.Efate I; Tuki Tuki Pt., Efate I; Malapoa Pt., Vila Harbour (all coll.Eker); Surunda, Espiritu Santo (coll.Coles); Ile Vate (AMS); LOYALTY IS: Lifu I (AIM); NEW CALEDONIA: Bourail (coll.Tourres); FIJI IS: Teruki, Kadavu I (coll.Powell); Naviti I, Yasawa group; Manava I, N. off Viti Levu (both coll.Eker); Vanua Balavu (coll.Richardson); TONGA IS: (coll. Powell); SAMOA IS: Apia, Upolu (ZMC); Apia Harbour, 2-4 m (AIM); Malua (coll.Powell); Fagaitua Bay, Tutuila I (LACM); Pago Pago (AMS); Vaiale, Apia (coll.Scott).

In some Melanesian localities certain individuals have an obsolete sculpture on the dorsal side of the body whorl, and this smooth form has received the name *gibbosuloidea* Habe & Kosuge. This smoother form is sympatric with the typical form in the Solomon Is, New Hebrides, Fiji and Samoa Is, and there is a gradual intergradation from the typical reticulated form to the smooth form in these populations. Kaicher's (1982) contention that the aperture is more noticeably oblique in *gibbosuloidea* is misleading. Both types of *N.globosus* and *N.gibbosuloidea* have about the same obliquely oriented aperture, a feature which is subject to variation.

Kay (1979) does not report the species from the Hawaiian Islands and the previous Hawaiian Is record was based on specimens from the A.W.B.Powell collection, labelled "Oahu, Hawaiian Is". The species does not appear to live eastward of the Samoa Is, and Dautzenberg & Bouge's (1933) record of "Society Is" also requires confirmation.

Nassarius (Plicarcularia) oneratus (Deshayes, 1863)
(Plate 6, figs.11-13)

1854. *Nassa obliqua* Rousseau, Voy.Pole Sud, Zool.5:84, pl.21,figs.43,44; 1868 Pease, Americ.J.Conch. 4:108 (non *Buccinum obliquum* Kiener, 1841 = *Nassarius*).
1863. *Nassa onerata* Deshayes, Cat.Moll.Ile Reunion p.130, pl.12, figs.24,25.
1865. *Nassa obliqua* Pease, Proc.Zool.Soc.Lond. p.513 (described as new species).
1877. *Nassa onerato (sic)* Desh., Marrat, Prop.new forms genus *Nassa* pl.1, fig.28.
1967. *Nassarius oneratus* (Deshayes), Orr-Maes, Proc.Acad.Nat.Sci.Philadelphia 119(4):136, pl.13, fig.G; 1982 Kaicher, Card cat.world-wide shells, Pack No.31: card 3190.
1978. *Nassarius (Plicarcularia) oneratus* (Deshayes), Cernohorsky, Trop.Pacific mar.shells p.80, pl.24,fig.5.

Shell up to 16.0 mm in length, solid, body whorl oblique, teleoconch of 4¼-4¾ whorls, protoconch of 2¾ finely carinate embryonic whorls, carina frequently worn away, spire of shell concave; post-embryonic whorls with axial riblets and 3 rows of granules, penultimate whorl with 2 rows, body whorl with usually 6 rows of somewhat spinose nodules, interspaces with fine axial striae. Aperture very small, outer lip with 9-12 lirate denticles, columellar callus very large, almost reaching body whorl suture, outer lip joining anal canal in a shallow groove and spur, siphonal canal prominent. White to cream in colour, last 4 rows of nodules on body whorl connected with reddish-brown spiral lines, callus-shield porcellaneous-white, interior of aperture bright orange or yellow. Operculum brown in colour, serrate at margins.

Rachidians of radula with 12 denticles, lateral teeth simple bicuspid, lateral accessory plate present (Fig. 27).

TYPE LOCALITY. Reunion I, Indian Ocean *(oneratus)*; Solomon Is (*obliqua* Rousseau); islands of the central Pacific (*obliqua* Pease).

DISTRIBUTION. From Reunion Is to the Marianas Is, and Lifu, Loyalty group. In coral sand, sand-pockets and among sea-weed, from the intertidal zone to a depth of 22 m.

Type specimens. A syntype of *N.oneratus* (Deshayes) is in the Deshayes collection of the Ecole des Mines, Paris, No 6546, length 14.5 mm, and the other 13.0 mm long syntype probably remained in Maillard's collection. The holotype of *Nassa obliqua* Rousseau, is in the Muséum National d'Histoire Naturelle, Paris, and the type of *N.obliqua* Pease is lost.

Material examined. REUNION I: Lagon de la Saline (coll.Martin); INDONESIA: Pulau Stupai, Mentawi I, Sumatra (USNM); MARIANAS IS: off Orote Pt., Guam I, 18-22 m (coll. Deynzer; coll.McCausland); Saipan I (coll.Richardson); Uso Cabras I, Guam I; N.Tipilao Pt., Guam I, 12 m (both coll.Salisbury); LOYALTY I: Lifu I (AMS; USNM).

Nassarius (Plicarcularia) granifer (Kiener, 1834)
(Plate 7, figs.1,2)

1789. *Buccinum verrucosum* Bruguière, Encycl.Meth.vers 1:279 (ref.Lister, pl.972, fig.27); 1817 Dillwyn, Desc.cat.Rec.shells 2:605; 1825 Wood, Index Test. p.107, pl.22,fig.45; 1856 Hanley in Wood, Index Test. p.113, pl.22,fig.45. (nomen oblitum).
1834. *Buccinum graniferum* Kiener, Spéc.gen.icon.coq.viv. 9:100, pl.27,fig.111.
1853. *Nassa granifera* Kiener, Reeve, Conch.Icon. 8:pl.11,fig.72; 1890 E.A.Smith, J.Conch. 6:266; 1899 Hedley, Mem.Austral.Mus. 3:462; 1907 Couturier, J.Conchyl. 55:138; 1934 Mari, J.Conchyl. 78:39.
1879. *Nassa (Arcularia) granifera* Kiener, E.A.Smith, Proc.Zool.Soc.Lond. p.810;1886 Watson, Rept.Sci.Res.voy.H.M.S."Challenger" 15:178; 1895 Melvill & Standen, J.Conch. 8:107; 1933 Dautzenberg & Bouge, J.Conchyl. 77:213; 1955 Marche-Marchad, J.Conchyl. 95:30.
1880. *Nassa perlata* Marrat, Var.shells genus *Nassa* p.65 (ref. Reeve, pl.11, fig.72).
1957. *Nassarius graniferus* (Kiener), Kaicher, Indo-Pacific Seashells pl.7, fig.4; 1967 Orr-Maes, Proc.Acad.Nat.Sci.Philadelphia 119(4):136; 1975 Tchang Si *et al.*, Studia Marina Sinica No.10:123,pl.4,fig.16; 1982 Kaicher, Card cat.world-wide shells, Pack No.31: card 3164.
1961. *Plicarcularia graniferus* Kiener, Habe, Col.illust.shells Japan 2:64, pl.32, fig.12.
1964. *Arcularia (Plicarcularia) granulifera (sic)* Kiener, Habe, Shells west. Pacific col. 2:99, pl.32, fig.12.
1971. *Plicarcularia granifera* Kiener, Wilson & Gillett, Austral.shells p.102, pl.66, figs.6,6a.
1972. *Nassarius (Plicarcularia) graniferus* (Kiener), Cernohorsky, Rec.Auckland Inst.Mus. 9:fig.15 (shell), figs.27,28 (radula); 1972 Cernohorsky, Mar.shells Pacific 2:146, pl.42,fig.5.

Shell up to 25.0 mm in length, elongate-ovate, solid, teleoconch of 4½-6¼ whorls, protoconch of 2½-2¾ milky-white embryonic whorls, last whorl carinate; sculptured with spiral rows of granules which number 2 on the penultimate and 4-5 on the body whorl; a spiral groove which is paired on the penultimate whorl and at the body whorl suture, separates rows of nodules; intervening spaces contain macroscopic hairlines. Aperture very small, outer lip denticulate-lirate, columellar callus large, moulded to the shell and spreading almost to the apex, columella smooth or with 1-3 denticles. Cream

to light fawn in colour, nodules whitish, back of anterior canal bordered with yellow or orange, columellar callus shining porcellaneous-white, interior of aperture yellow. Operculum brown, generally serrate at margin but some individuals with simple margins.

TYPE LOCALITY. Foulepoint, Madagascar, and Ceylon *(verrucosum)*; East Indies *(granifer)*; Philippines *(perlata)*.

DISTRIBUTION. From East Africa throughout the tropical Indo-Pacific to the Tuamotu Archipelago. In coralline sand and among *Zoostera* grass, from the intertidal zone to a depth of 22 m.

Type specimens. The whereabouts of the type of *N.granifer* (Kiener) is unknown, but the original description and illustration are sufficient for the recognition of the species. The type of *Buccinum verrucosum* Bruguière, is lost, and the type of *Nassa perlata* Marrat, is probably in the general collection in the British Museum (N.H.), London.

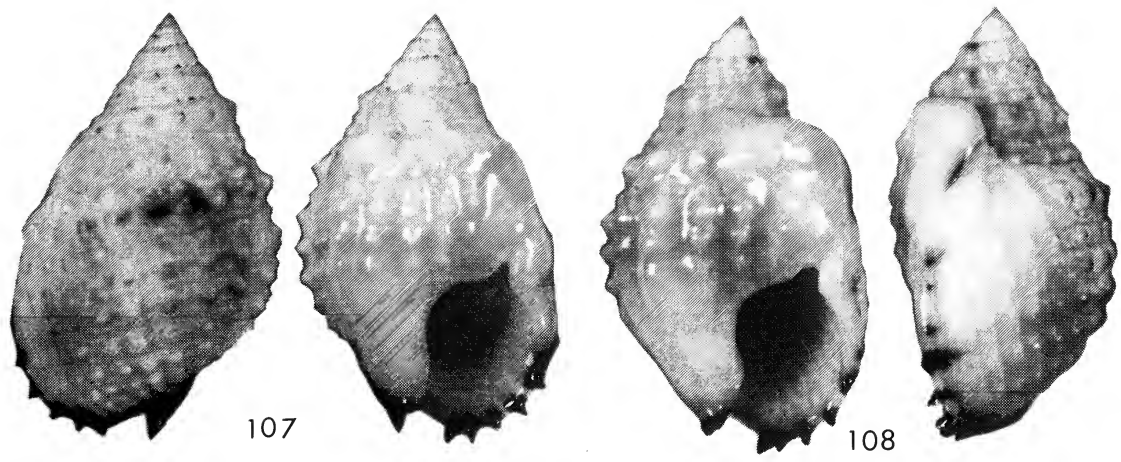
Material examined. EAST AFRICA: Zanzibar (USNM); W.Geyser Bank, Comoro Is, 12°22'S & 46°24'E, 20 m (MNHNP); MADAGASCAR: Tulear (SMOM); REUNION I: Lagon de la Saline (coll.Martin); NICOBAR IS: (ZMC); COCOS-KEELING IS: Direction I (ANSP); West I (USNM); MARIANAS IS: Tumon Bay, Guam I (coll.Gardner); off Orote Pt., Guam I, 18-22 m (coll.Deynzer); Piti Beach and Cocos I, both Guam I (coll.McCausland); Saipan I; Asan Pt., Guam I (both USNM); CAROLINE IS: Yap I (USNM); near Uruk Thapal I, Palau Is; Truk I (both coll.McCausland); Param I, Ponape I (coll.Parkinson); MARSHALL IS: Lae I, Lae Atoll; Rongelap Atoll; Kwajalein Atoll; Namu I, Bikini Atoll; Wotho I, Wotho Atoll; Rigili I, Enewetak Atoll; Mejatto I, Jaluit Atoll (all USNM); WEST IRIAN: S.W. of Biak wharf (coll. Powell); PAPUA NEW GUINEA: Mongop near Kavieng, New Ireland (AMS); Laing I, Hansa Bay (coll.Tursch); Madang (coll.Hoeter); Port Moresby (AMS); AUSTRALIA: Lizard I, Qld. (coll.Willan); Marion reef, Coral Sea; N.E.Herald Cay, Coral Sea; Michaelmas Cay, N.E.Cairns; off Cardwell; Lizard I; Little Upolu Cay, N.E. of Cairns; Lady Elliott I, all Queensland (all AMS); Ballina, New South Wales (AMS); SOLOMON IS: Lavanggu, Rennel I (ZMC); Matui I, Marovo lagoon, New Georgia (Auckland Univ.); Lunga Pt., Guadalcanal, 12 m (coll.Dillworth); Lever Pt., Russell I (coll.Bratcher); Vanikoro I, Santa Cruz group (AMS); Pavuvu I, Russell Str. (USNM); NEW HEBRIDES: Tutuba I (coll.Coles); Malapoa Pt., Efate I (coll.Bratcher); Kakula I, N.Efate I (coll.WOC); LOYALTY IS: Lifu I (AIM; AMS; USNM); Shepeneke, Lifu I (ZMC); Ouvea I (coll.Coles)' Isle des Pins; Flat Deguala, Ouvea (both USNM); NEW CALEDONIA: (AMS); FIJI IS: Manava I, N.off Viti Levu (coll.Eker); W.of Rat Tail Passage, Suva reef; Yadua I, off Lautoka (both coll.Marrow); Varo I, Gt.Astrolabe reef (ZMC); Korolevu Bay, Kadavu I; Vorovoro I, Vanua Levu; Rabi I, W.coast of Vanua Levu; Naselesele Pt., Taveuni; Tulane harbour, Koro; Matuku (all USNM); Nadi Bay (AMS); Karoni I and Moce I, both Lau group (both AIM); Namotu Barrier reef, Mamanuca group (coll.WOC); COOK IS: Rarotonga (AIM); Avatiu harbour, Rarotonga (USNM); LINE IS: Palmyra I (USNM); AUSTRAL IS: Tubuai I (coll.Trondle); SOCIETY IS: Tahiti (ZMC; BMNH); Bora Bora (coll.Wade); Fare Ute Pt., Papeete; Patutoa; Tautira, all Tahiti; Motu Onetahi and Motu Rimatuu, both Tetiaroa I; Maharepa and Opunohu Bay, both Moorea I; Pt.Tira and Motu Vavara, both Huahine I; Motu Tipaemu and Moty Iriru, both Raiatea I (all USNM); Mitirapa, Tahiti (coll. WOC); Papara and Hitiaa, both Tahiti (both coll.Trondle); Ilot Trioa, Moorea I; Mahina, Tahiti (both AIM); TUAMOTU ARCHIPELAGO: Motu Fara, Rangiroa I (coll.Bratcher); Anaa I (coll.Trondle); Motu Ahi and Vaiea village, Maupiti; Matihi I, Tikahau I; Garumaoa I; Rairoa I; Teteu I (all USNM); GAMBIER ARCHIPELAGO: (coll.Powell); Aukena I; Mangareva I (both USNM).

Nassarius granifer is the commonest *Plicarcularia* in the Indo-Pacific and is usually encountered in colonies. The epithet *verrucosum* Bruguière, 1789, although an earlier name for *N.granifer*, has not been used since 1856, and since *N.granifer* has been used the required 10 times by 5 different authors, it is regarded as established in malacological literature, and *Buccinum verrucosum* Bruguière, is considered to be a *nomen oblitum*.

Nassarius (Plicarcularia) troendleorum Cernohorsky, 1980
(Figs. 107,108)

1980. *Nassarius troendleorum* Cernohorsky, Rec.Auckland Inst.Mus. 17:118, figs.15-17 (shell), fig.25 (protoconch).

Shell up to 25.0 mm in length, ovate and solid, teleoconch of 5½-6½ almost flat-sided whorls, protoconch of 2¾-3 smooth, embryonic whorls, juvenile specimens with a faint keel on protoconch whorls, keel absent in adults; sculptured with prominent, round nodules which are arranged in 3-5 spiral rows on the penultimate and 9-10 rows on the body whorl; the sutural row of nodules on the body whorl is smaller than the second anterior row which is usually most prominent. Interspaces of nodules sculptured with finely impressed grooves which number from 3-6 on the penultimate and from 8-15 on the body whorl. Aperture moderately narrow and with 11-13 distinct lirae within and 5 sharp denticles on the edge of the outer lip, columellar callus large and broad and reaching posterior sutures of penultimate whorl, callus thinning above parietal wall, columella with 0-4 weak basal denticles. White in colour, dorsum of body whorl stained with rusty-brown, denticles on outer lip, tip of siphonal canal and edge of siphonal notch blackish-brown, aperture white.



Figs. 107, 108. *Nassarius (Plicarcularia) troendleorum* Cernohorsky. 107. Holotype, AIM No. TM-1365; 24.5 mm. 108. Paratype; 21.9 mm.

TYPE LOCALITY. Punaauia, Tahiti, French Polynesia.

DISTRIBUTION. From New Caledonia to the Kingsmill group, Gilbert Is and the Tuamotu Archipelago. In sand, intertidal and subtidal.

Type specimens. The holotype of *N.troendleorum* Cernohorsky, is in the Auckland Institute and Museum, No.TM-1365, length 24.5 mm.

Material examined. NEW CALEDONIA: Ile Ouen, south coast (coll.Aillaud); GILBERT IS: Kingsmill group (BMNH); SOCIETY IS: Moorea I (coll.Busson); TUAMOTU ARCHIPELAGO: Anaa I (MNHNP; coll.Trondle).

Three specimens of this species have been in the British Museum (N.H.), London, since last century, and they bear the label *"Nassa serratina* or *N.serrifera* Pease — Kingsmill Ids.". Pease probably intended to describe the species but the description has never been published.

Subgenus **Niotha** H. & A. Adams, 1853

Niotha H. & A.Adams, 1853, Gen.Rec.Moll. 1:117. Type species by SD (Cossmann, 1901) *Nassa cumingii* A.Adams, 1852 = *Buccinum conoidale* Deshayes in Bélanger, 1832. Recent, Indo-Pacific.

1877. *Niothia* Brazier, Proc.Linn.Soc.N.S.W. 1:178 (Invalid emend.).

1936. *Tavaniotha* Iredale, Rec.Austral.Mus. 19:321.337. Type species by OD *Nassa optata* Gould, 1860 = *N.nigella* Reeve, 1854. Recent, S.E. Australia (nomen nudum — art.13(i) of ICZN).

Shell moderately small, 6.0-30.0 mm in length, sculptured with axial ribs, spiral striae, granules or spinose nodules, sutures simple or canaliculate; aperture ovate, columellar callus frequently thick but less expanding than in *Nassarius s.str.* or *Plicarcularia*, denticulate anteriorly, outer lip denticulate-lirate, interior of aperture smooth or lirate, siphonal canal short, anal canal distinct. Operculum brown and with simple or serrate margins.

Laterals of radula generally with simple cusps but occasionally inner cusps denticulate, accessory lateral plate usually present.

GEOGRAPHICAL DISTRIBUTION. Tropical and temperate Indo-Pacific.

STRATIGRAPHICAL RANGE. Miocene to Recent.

The subgenus is not particularly well defined and is intermediate in characters between *Nassarius s.str* and the subgenus *Zeuxis*. Some species with merging characteristics may be equally as well placed in *Niotha* as in *Zeuxis*. The subgenus contains 38 Recent species and 1 subspecies from the tropical Indo-Pacific and 7 fossil species.

Nassarius (Niotha) conoidalis (Deshayes in Bélanger, 1832)
(Plate 7, figs. 3-10)

1816. *Nassa clathrata* Lamarck, Tabl.Encycl.Méth. p.1, pl.394, figs.5a,b; 1842 Reeve, Conch.Systematica 2:237, pl.169,fig.4 (non *Buccinum clathratum* Born, 1778 = *Nassarius).*

1822. *Buccinum gemmulatum* Lamarck, Hist.nat.anim.s.vert. 7:271; 1834 Deshayes in Laborde & Linnant, Voy.l'Arabie Petrée p.66, figs.35,36; 1834 Kiener, Spéc.gen.icon.coq.viv. 9:85,pl.22,fig.84 (non Wood, 1818).

1825. *Buccinum clathratum* Wood, Index Testac. p.112,pl.23,fig.114 (non Born, 1778).
1832. *Buccinum conoidale* Deshayes in Bélanger, Voy.Indes-Orientales Zool. p.433, pl.3,figs.6,7.
1852. *Nassa verrucosa* A.Adams, Proc.Zool.Soc.Lond. Pt.19:97; 1853 Reeve, Conch.Icon. 8:pl.6,fig.36; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:44 (non *Buccinum verrucosum* Bruguière, 1789; nec Gmelin, 1791 = *Nassarius).*
1852. *Nassa variegata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:97; 1853 Reeve, Conch.Icon. 8:Pl.11,fig.70; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:44.
1852. *Nassa cumingii* A.Adams, Proc.Zool.Soc.Lond. Pt.19:98; 1853 Reeve, Conch.Icon. 8:pl.5, figs.30a,b.
1853. *Nassa gemmulata* Lamarck, Reeve, Conch.Icon. 8:pl.5,gih.29; 1863 Crosse & Fischer, J.Conchyl. 11:377; 1885 Cooke, Ann.Mag.Nat.Hist. (5), 15:327; 1891 E.A.Smith, Proc.Zool.Soc.Lond. p.407; 1903 E.A.Smith, Proc.Malac.Soc.Lond. 5:373; 1933 King & Ping, Hongkong Natur. 4(2):104,fig.19; 1959 Barnard, Ann.Sth.Afric.Mus. 45:114,fig.22g (radula); 1973 Kensley, Sea-shells Sth.Africa p.160,fig.594.
1854. *Nassa ringens* Reeve, Conch.Icon. 8:pl.29,fig.190 (non Michelotti, 1847).
1855. *Desmoulea ringens* A.Adams, Proc.Zool.Soc.Lond. for 1854:42, pl.26,fig.6.
1870. *Niotha cumingii* A.Adams, Ann.Mag.Nat.Hist. (4), 5:425; 1942 Yen, Proc.Malac.Soc.Lond. 24:233.
1877. *Nassa (Niotha) gemmulata* Lamarck, Brazier, Proc.Linn.Soc.N.S.W. 1:178; 1886 Watson, Sci.Res.Voy.H.M.S. "Challenger", Zool. 15:176; 1895 K.Martin, Samml.geol.Reiches-Mus.Leiden, N.F., 1:106; pl.17,figs. 237,237a; 1899 Melvill & Sykes, Proc.Malac.Soc.Lond. 3:220; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:412; 1903 Sturany, Denk.k.Akad.Wiss.math.-nat. Classe 74:244; 1903 Cossmann, J.Conchyl. 51:143, pl.5,fig.11; 1911 Schepman, Siboga-Exped. 49d:328; 1927 Fischer in Wanner, Palaeont.v.Timor,Lief. 15(25):71; 1928 Yokoyama, Imp.Geol.Surv. Japan Rept. No.101:40, pl.2,fig.8; 1955 Marche-Marchad, J. Conchyl. 95:37.
1895. *Nassa (Niotha) rajaensis* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.F. 1:106, pl.17,figs.238,238a; 1939 Oostingh, Ing.Ned.Indie Mijnb.Geol. 6(12):186.
1911. *Nassa (Niotha) gemmulata* var. *variegata* A.Adams, Schepman, Siboga-Exped. 49d:328.
1918. *Nassarius gemmulatus* Lamarck, Hedley, J.Proc.R.Soc.N.S.W. 51:M88; 1936 Coll.Jap.shells ed.5:75, pl.106,fig.9; 1957 Kaicher, Indo-Pacif.Sea shells pl.7,fig.19.
1928. *Nassarius (Niotha) gemmulatus* Lamarck, Melvill, Proc.Malac.Soc.Lond. 18:106; 1930 Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:50; 1936 Nomura & Zinbo, Sci.Repts.Tohoku Univ.Sendai, (2), Geol. 18:255; 1939 Oostingh, Ing.Ned.Indie Mijnb.Geol. 6(12):185,pl.16,figs.290,291; 1946 Habe, Venus:Jap.J.Malac. 14:196, textfig.16 (radula); 1960 MacNeil, U.S.Geol.Surv.Prof.Pap.No.339:79, pl.13.fig.29.
1928. *Nassarius (Niotha) verrucosus* (A.Adams), Melvill, Proc.Malac.Soc.Lond. 18:106.
1929. *Nassa (Niotha) labordei* "Jousseaume", Mari, Butl.Inst.Catalana Hist.Nat. (2), 8:137, pl.6,fig.4.
1929. *Niotha comtessei* Iredale, Austral.Zool. 5:349, pl.38,fig.13; 1955 Cotton, Sth.Austral.Malac.Sect.R.Soc. No. 7:2,fig.19; 1961 Rippingale & McMichael, Queensl. & Gt.Barrier reef shells p.105,pl.13,fig.25; 1962 Iredale & McMichael, Austral. Mus.Mem.No.11:67; 1969 Garrard, J.Malac. Soc.Australia No.12:67.
1930. *Nassarius (Niotha) gemmulatus* var. *verrucosa* A.Adams, Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:50.
1945. *Nassarius (Niotha) gemmulatus* var. *variegatus* A.Adams, Altena & Beets, Verh.Geol.-Mijnb.Genoot.Ned.Kolon., Geol.ser., 14:42.
1954. *Nassarius (Niotha) clathratus* Lamarck, Kira, Col.Illust.shells Japan, 1:56, pl.28,fig.19; 1961 Hayasaka, Sci.Repts.Tohoku Univ.Sendai, (2), Geol. 33(1):85, pl.11, figs.3a,b.
1967. *Niotha clathrata* (Lamarck), Habe & Kosuge, Stand.book Jap. shells col. 3:70, pl.29,fig.38.
1971. *Niotha gemmulata* Lamarck, Wilson & Gillett, Austral.shells, p.102, pl.66,figs.10,10a.
1972. *Nassarius (Niotha) variegatus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:140, figs.36,37.
1972. *Nassarius (Niotha) stigmarius* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:141, figs.38,39 (shell), fig.57 (radula) [non *Nassa stigmaria* A.Adams, 1852].
1973. *Niotha clathratus* (Lamarck), Habe, Ann.Rept.Noto Mar.Lab. 13:21.
1978. *Nassarius (Niotha) conoidalis* (Deshayes in Bélanger), Cernohorsky, Trop.Pacific mar.shells p.81, pl.24,fig.6.

Shell up to 31.0 mm in length, inflated and rotund, teleoconch of 5-6¾ convex whorls, protoconch of 3-3¾ smooth, embryonic whorls, last whorl finely carinate, sutures broad and flat or narrow and canaliculate; sculptured with regular granules which are arranged in 15-33 axial ribs on the body whorl and 17-30 ribs on the penultimate whorl; the granules form 4-5 spiral rows on the penultimate and 8-10 rows on the body whorl. Columellar callus spreading onto body whorl, thinning next to parietal wall, wrinkled and laminated anteriorly; columellar denticles irregular, numbering from 5-10 and generally appearing as small plicae or wrinkles. Aperture wide and striate within, outer lip denticulate and occasionally with short spines on the edge, siphonal notch very deep, anal canal prominent. Uniformly straw-yellow, fawn or light brown in colour, body whorl occasionally with 2 broad brown bands, columellar callus white or cream, interior of aperture white, banded with purplish-grey. Periostracum thin, translucent, straw-yellow in colour. Operculum brown and serrate on margins.

TYPE LOCALITY. Seas of Sondé [= Sunda Seas, Indonesia] *(conoidalis)*; none *(clathratum* Lamarck; *gemmulatum; ringens)*; Dalmaguete, Negros I, Philippines *(variegata)*; Eastern Seas *(verrucosa)*; China *(cumingii)*; Rajah [= Bajah], Mantjeuri River, Bantam, Pliocene of Java *(rajaensis)*; Sydney Harbour, Australia *(comtessei)*; Aden *(labordei)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf throughout the tropical Indo-Pacific to the Line Islands and questionably the Tuamotu Archipelago (record in AMS). In coralline and black sand, usually subtidal to a depth of 120 m.

Type specimens. Three syntypes of *N.conoidalis* (Deshayes in Bélanger) are in the École des Mines, Paris, and the specimen measuring length 19.1 mm, width 12.5 mm, is here selected as the lectotype (Pl.7,fig.3). Two syntypes of *Nassa variegata* A.Adams, are in the British Museum (N.H.), London, and the syntype length 17.3 mm, is here selected as the lectotype (Pl.7.fig.4). The holotype of *N.verrucosa* A.Adams, is in the same Institution No.1973120, length 23.4 mm. The holotype of *N.cumingii* A.Adams, is also in the British Museum (N.H.), No.1962914, length 25.3 mm, as is the juvenile holotype of *N.ringens* Reeve (also type of *Desmoulea ringens* A.Adams) No.1973166, length 15.3 mm. The type of *N.rajaensis* K.Martin, is in the Rijksmuseum van Geologie en Mineralogie, Leiden, the holotype of *N.comtessei* (Iredale), is in the Australian Museum, Sydney, No.C-57847, length 30.4 mm, and the holotype of *N.labordei* Mari, is in the Institut Royal des Sciences Naturelles, Brussels, length 30.0 mm.

Material examined. RED SEA: Eilat, Gulf of Aqaba; off Mersat Abu Samra, 49-55 m (both TAU); Aden (BMNH); PERSIAN GULF: 38 km E. of Bahrein, 33 m; 3 km S.E. of N. end of Quais I, 26°32'N & 54°04'E, 27 m (both ZMC); GULF OF OMAN: Muscat (coll.Powell); EAST AFRICA: Mozambique (USNM); MADAGASCAR: Tulear (SMOM); MAURITIUS: (ZMC); SOUTH AFRICA: Cape Town (ZMC); INDIA: off Tranquebar, 11°06'N & 80°05'E, 28 m (ZMC); Puri (ZSI); ANDAMAN IS: (ZSI); INDONESIA: W. of Babi I, Wokam, Aru I, 55-64 m; W. of Tg Derehi, Trangan, Aru I, 49 m; off W. coast of Wasir I, W.Wokam, Aru I, 57-73 m; E. side of Mitduan reef, Nuhu Tju, Kai Is, 46 m (all WAM); S. Pagi I, Sumatra (USNM); near Java, 8°23'S & 114°29'E and 8°30'S & 114°28'E, 70-150 m; Samalona, Macassar, 35 m; Taca Baco, Macassar, 25 m; Amboina Bay, 128 m; Kei-Oerne, Kai Is, 32 m (all ZMC); Kuta Beach, Bali (coll.McCausland); off Saeawak coast, Borneo, 18-36 m (coll.WOC); PHILIPPINES: Port San Vicente, Luzon; S.E. of Tawi Tawi (both USNM); Dungaree Beach, Subic Bay (coll.Salisbury); Manila, ex-pisces (coll.Dan); Ligtang, Rosario, Carite, S.tip of Manila (coll.Richardson); Cebu (coll.Dayrit); CHINA: Hongkong (SDMNH; USNM); Fukien Province (SDMNH); Shui Hau Bay, Lantow I, Hongkong (AMS); TAIWAN: (USNM); JAPAN: Wakanoura, Kii; Iyo; Nashima, Awaji; off Honshu; Kagoshima Gulf; Kii, Honshu; Sagami Bay (all USNM); Shioya, Kii; Tosa, Kochi-ken (LACM); Enoshima (SDMNH); Satsuma, 5 m (AMS); Minoshima, Wakayama-ken; Tateyama, boshu; Mikawa; Kinomotu, Kii (all coll.Powell); Misaki (ZMC); Mikawa-isshiki, Honshu (NZGS); Kusui, 9 m (coll.Eker); PAPUA NEW GUINEA: Rabaul, New Britain (AMS); Laing I, Hansa Bay (coll.Tursch); AUSTRALIA: Northern Territory: Port Essington, Coburg Peninsula (AMS); Queensland: Daydream I, Whitsunday group; Horseshoe Bay, Magnetic I (both coll.Powell); Keppel Bay (NZGS); Gt.Keppel I; Yeppoon (both coll.Gardner); Yorkey's Knob; Langford reef (both AIM); Dingo Beach, Cape Gloucester; Mapoon, N.W. Cape York Peninsula; S. side of Lindeman I, Whitsunday Passage; Dundowran, Hervey Bay; Bustard Bay; E. of Keppel I, 46-49 m; Gulf of Carpentaria, 12°38'S & 141°00'E, 58 m; off Wide Bay, 55 m; S. of Woody I, near Fraser I; Big Sandy Cay, Swains reef, 9 m; off Albany I, Torres Str.; Queen's Beach, Bowen; Trinity Bay; off Burnett Heads, 46 m; off Cape Moreton; S. end of Stradbroke I, 48-59 m; Forsyth I, Gulf of Carpentaria; Albany Passage, 7-26 m; Tin Can Bay; Low Isles near Port Douglas (all AMS); New South Wales: Little River, Clarence Harbour; Sydney Harbour; off Iluka; off Sow & Pigs reef, Port Jackson; off Evans Head, 55 m; Black Rock, Richmond River; Woy Woy; Angourie, 29°29'S & 153°22'E (all AMS); Sydney Harbour (ZMC); NEW HEBRIDES: Vila, Efate I (coll.Lepage); Teuma Bay, Efate I, 37-46 m (coll.Eker); Mele Bay, Efate I (coll.Colardeau); LOYALTY IS: Ouvea I (coll.Coles); Lifu I (AMS); FIJI IS: Wakaya I, near Ovalau I (AIM); Momi Bay, W.Viti Levu, 27 m (USNM); Malolo Lailai, Mamanuca group, 18-22 m (coll.Jennings); Manava I, N. off Viti Levu (coll.Eker); LINE IS: Christmas I, 22 m (AIM); TUAMOTU ARCHIPELAGO: Akamaru (AMS) [record requires confirmation].

Fossil record. PLIOCENE: Kampong Tjikeusik, Java (K.Martin 1895); Karikal, India (Cossmann 1903); Akelamo valley, Obi I, Timor (Fischer in Wanner 1927); numerous localities from Byoritzu beds, Taiwan (Yokoyama 1928); Gabusoga, Simari beds, Okinawa, Ryukyu Is (Nomura & Zinbo 1936); Sindanghadji, Java; N.Atjeh, Sumatra; Ceram I; K. Drenges and K. Poentjoe, S. Rembang, Java (Oostingh 1939); Nakoshi, Okinawa, Ryukyu Is (MacNeil 1960); Tji Gugur, Priangan, W.Java (Altena & Beets 1945).

N.conoidalis is a variable species as far as sculpture is concerned. The typical form *conoidalis* (= *variegata* A.Adams = *cumingii* A.Adams), has a sculpture of numerous, close-set, slender axial riblets. The *verrucosus* form (= *labordei* Mari) has a coarser sculpture and fewer axial ribs, while *ringens* and *comtessei* are intermediate between the *conoidalis* and *verrucosa* forms.

The species is usually known under the homonymous names of *clathrata* Lamarck and *gemmulata* Lamarck, and *conoidalis* Deshayes in Bélanger, is the earliest replacement name available.

Nassarius (Niotha) desmoulioides (Sowerby, 1903)
(Plate 7, fig. 13)

1903. *Nassa desmoulioides* Sowerby, Mar.Invest.Sth.Africa 2:219, pl.4,fig.1; 1906 E.A.Smith, Ann.Natal Govt.Mus. 1:36; 1959 Barnard, Ann.Sth.Afric.Mus. 45(1):115, fig.22d (radula); fig.23c (protoconch); 1973 Kensley, Sea-shells Sth.Africa p.160, fig.591.
1928. *Nassarius desmoulioides* (Sowerby), Tomlin, Ann.Sth.Afric.Mus. 25(2):317.
1956. *Nassa desmouleoides* Sowerby, Knudsen, Atlantide Rept. No.4:49, pl.2,fig.3.

Shell up to 22.00 mm in length, almost ovate, light in weight, teleoconch of 5-6 convex whorls which are usually roundly subangulate at sutures, protoconch of 2-2½ smooth embryonic whorls; sculptured with moderately broad, rounded axial ribs which number from 18-25 on the penultimate and from 15-30 on the body whorl, ribs sometimes becoming obsolete or irregular on the dorsal side of the body whorl; spiral sculpture of numerous crisp, close-set overriding spiral striae which number 9-10 on the penultimate and 11-18 on the body whorl, siphonal fasciole with 7-9 oblique cords. Aperture moderately wide, outer lip not thickly variced, denticulate-lirate within, columellar callus moderately narrow, regularly bordered and laminate anteriorly, columella denticulate, siphonal notch prominent. White to cream in colour, ornamented with orange-brown, irregular blotches and axial streaks, sometimes small brown spots on cords, dorsal side of body whorl more deeply pigmented. Operculum brown and serrate at margins.

TYPE LOCALITY. Umhloti river mouth, Natal, South Africa, 183 m.

DISTRIBUTION. From Guinea, West Africa to Natal, South Africa. Subtidal, to a depth of 227 m.

Type specimens. Three syntypes of *N.desmoulioides* (Sowerby) are in the British Museum (N.H.), London, No.1903. 7.27.80.2., and the specimen measuring length 21.4 mm, width 13.2 mm, is here selected as the lectotype (Pl.7 Fig.13).

Material examined. SOUTH AFRICA: Umhloti river mouth, Natal, 183 m (BMNH); Cape Natal (coll.Ackermann).

Literature records. WEST AFRICA: Off Guinea, 13°43'N & 17°23'W, 65-90 m; off Sierra Leone, 7°29'N & 13°38'W, 74-79 m; off Liberia, 4°24'N & 7°05'W, 78 m and 5°06'N & 9°34'W, 78 m; off the Congo, 5°02'S & 11°14'E, 55 m (all Knudsen 1956); SOUTH AFRICA: off Cape Natal, 99 m; off Great Fish Pt., 97 m; off Natal, 29°46'S & 31°17'E, 110-128 m; Zululand to Algoa Bay and Agulhas Bank, 73-183 m; off Cape Vidal, Zululand; Brown's Bank, *c.* 36°30'S & 21°00'E (all Barnard 1959); Agulhas Bank, Algoa Bay and Natal coast, 73-227 m (Tomlin 1928).

Nassarius (Niotha) albescens albescens (Dunker, 1846)
(Plate 7, Figs. 11,12; Plate 8, Fig. 1)

1846. *Buccinum albescens* Dunker, Zeit.f.Malakozool. 3:170; 1849 Philippi, Abb.Beschr.Conchyl. 3:68, pl.2,fig.15.
1852. *Nassa retecosa* A.Adams, Proc.Zool.Soc.Lond.Pt.19:97; 1853 Reeve, Conch.Icon. 8:pl.5,figs.28a,b.
1853. *Nassa albescens* Dunker, Reeve, Conch.Icon. 8:pl.15,fig.100; 1868 Pease, Americ.J.Conch. 4(3):108; 1879 Brazier, J.Conch. 2:187.
1854. *Nassa bicolor* Rousseau, Voy.Pole Sud. Zool. 5:84, pl.21,figs.41,42 (non *Buccinum bicolor* Philippi, 1851 = *Nassarius*).
1880. *Nassa adamsiana* Marrat, Var.shells genus *Nassa* p.99 (nom.subst.pro *Nassa retecosa* A.Adams, 1852).
1877. *Nassa (Niotha) albescens* Dunker, Brazier, Proc.Linn.Soc.N.S.W. 1:179; 1895 Melvill & Standen, J.Conch. 8:107; 1911 Schepman, Siboga-Exped. 49d:326.
1934. *Nassa baguenai* Mari, J.Conchyl. 78:30 (nom.subst.pro *Nassa retecosa* A.Adams, 1852).
1936. *Nassarius albescens* Hirase, Coll.Japan.shells p.75,pl.106,fig.7; 1957 Kaicher, Indo-Pacific Sea shells pl.7,fig.12.
1955. *Nassa (Niotha) reticosa (sic)* A.Ad, Marche-Marchad, J.Conchyl. 95:34.
1955. *Niotha albescens* Dunker, Cotton, R.Soc.Sth.Austral.Malac.Sect. No.7:2, fig.18; 1961 Habe, Col.Illust.shells Japan 2:64, pl.32,fig.10.
1961. *Nassarius bicolor* H. & J., Marsh & Rippingale, Queensl. & Gt.Barrier reef shells p.105, pl.13,fig.26.
1962. *Niotha bicolor* Iredale & McMichael, Aust.Mus.Sydney Mem. No.11:67; 1964 Habe, Shells west.Pacif.col. 2:99, pl.32,fig.10; 1971 Wilson & Gillett, Austral. shells p.102, pl.66,figs.7,7a.
1972. *Nassarius (Niotha) albescens albescens* (Dunker), Cernohorsky, Rec.Auckland Inst.Mus. 9:144, figs.43,44 (shell), fig.59 (radula).
1982. *Nassarius albescens albescens* (Dunker), Kaicher, Card cat.world-wide shells, Pack No.31: card 3134.

Shell up to 20.0 mm in length, elongate-ovate, teleoconch of 4½-5½ weakly convex whorls which are subangulate at sutures, protoconch of 2¾-3 glassy embryonic whorls, last whorl finely carinate; sculptured with numerous small nodules which are arranged in the form of axial ribs numbering from 20-30 on the penultimate and from 30-40 on the body whorl; two rows of nodules anterior to sutures

usually doubled up. Columellar callus thick and porcellaneous, squared on top and extending onto body whorl without reaching the body whorl suture; interior of aperture lirate, outer lip with 10-12 denticles, columella with 3-9 small plicae or short denticles. Cream, yellow or fawn in colour, occasionally faintly banded and sprinkled with brown, protoconch golden-brown, 3-4 post-embryonic whorls violet or purplish-brown, aperture white. Operculum brown and serrate at margins.

TYPE LOCALITY. West Indies = error! *(albescens)*; Vavao, Samoa *(bicolor)*; Albay, Luzon, Philippines, 11 m *(retecosa*; *adamsiana*; *baguenai)*; Bali, Indonesia, is here designated as the type locality of *N.albescens albescens* (specimens in AMS).

DISTRIBUTION. From the Nicobar Is to Japan and the Cook Is. In clean, coralline, weedy or muddy sand, from the intertidal zone to a depth of 20 m.

Type specimens. Three syntypes of *N.albescens albescens* (Dunker), are in the Zoological Museum, Humboldt University, Berlin, and the specimen measuring length 14.5 mm, width 9.5 mm, is here selected as the lectotype (Pl.7, fig.11). Three syntypes of *Nassa retecosa* A.Adams (which are also the types of *N.adamsiana* Marrat and *N.baguenai* Mari), are in the British Museum (N.H.), London, No.1973119 and the immature syntype, length 20.3 mm, width 12.8 mm, is here selected as the lectotype (Pl.7,fig.12).

Material examined. NICOBAR IS: Nancowry (ZMC); THAILAND: Ko Lon I (ZMC); Koh Phuket; Pulau Tanga, Butang group (both USNM); INDONESIA: Pulau Siburu, S.W.Sumatra; Pulau Stupai, Mentawai Is, S.W.Sumatra; Pulau Bai, Batu group, off Sumatra; Morotai, Halmahera group; Pulau Penju, S. of Sumatra (all USNM); Pulau Putri, Pulau Seribu, N.of Jakarta; Batu Capea, S. of Ambon; Pantai Kelapa Lima, W.Timor; Pulau Putri; Sanur Beach, Bali; Mali, Alor I, Timor (all coll.McCausland); Bail (AMS); PHILIPPINES: Tubajon Bay, Dinagat, 10°20'N & 125°32'E; Cebu (both ZMC); Port Mataloi, Luzon; Little Santa Cruz I, Zamboanga, Mindanao; Maricaban I, Luzon; Papatag I, Tawi Tawi group; Tilig, Lubang I (all USNM); San Juan, Tayabas Bay, Batangas, Luzon (AMS); Punta Engano, Mactan I, Cebu (coll.Dan); Puerto Princesa, Palawan group (coll.Norton); TAIWAN: (coll.Salisbury); RYUKYU IS: near Ora Wan, Okinawa I (USNM); Bolo Pt. and Seragaki, both Okinawa I (coll.Deynzer); JAPAN: Yokohama; Loochoo Is (both USNM); CAROLINE IS: Schonian Harbour, Peleliu, Palau I, 2 m (coll.Powell); Navigator I; Ponape (both USNM); Arakabesan, near Koror, Palau Is; Ponape lagoon (both coll.McCausland); MARIANAS IS: Piti Pt., Guam I (coll.Deynzer); WEST IRIAN: E. side of Rouwe I, Aoeri I, Geelvink Bay (coll.Powell); Biak (AMS); PAPUA NEW GUINEA: Kalili Bay, New Ireland (ZMC); Manus I, Admiralty group (USNM); Mongop near Kavieng, New Ireland; Woodlark I (both AMS); Rabaul, New Britain (coll.Prior); Madang (coll.Hoeter); AUSTRALIA: Western Australia: Cape Leveque (AMS); North West Cape (coll.Hansen); Queensland: Daydream I, Whitsunday group; Townsville (both AIM); Horseshoe Bay, Magnetic I; Sth.Barnard I; Long Beach, Keppel Bay (all coll.Powell); Stradbroke I (NZGS); Lizard I (coll.Willan); Cooya Beach, N.of Port Douglas (coll.Gardner); Bowen; Tryon I, Capricorn group; Green I, off Cairns; N.Keppel I; Hayman I, Whitsunday group; Heron I, Capricorn group; Bramble Bay, Torres Str,; Lady Elliott I; Murray I, Torres Str.; Dingo Beach, Proserpine; Hope I, S. of Cooktown; Eclipse I, Palm group, N. of Townsville; Low Isles near Port Douglas; Fitzroy I; Michaelmas Cay, off Cairns; Armit I; Big Sandy Cay, Swains reef; Langford reef, N.of Mackay; Three I, Cape Flattery; Fairfax I, Bunker group; Northwest I, Capricorn group (all AMS); New South Wales: Wooli; Ballina (both AMS); LORD HOWE I: (AMS); NORFOLK I: (AMS); SOLOMON IS: Mendana; Komimbo Bay, Guadalcanal; Paleki I, Marovo lagoon, New Georgia; Matui I; Marau Sound, Guadalcanal (all Auckland Univ.); Tulagi I, Florida group (coll.Hallinan); Florida I; Pavuvu I, Russell Str. (both USNM); Vanikoro I, Santa Cruz group; New Georgia (both AMS); NEW HEBRIDES: Malapoa Pt., Vila Harbour; Erakor lagoon, Efate I; Port Havannah, N.Efate I; Kakula I, Undine Bay (all coll.Eker); Pango Beach, Efate I (coll.Coles); Takara, Efate I (coll.Bratcher); Point Arbel, Vila (NMW); Aneityum (AMS); Surunda, Espiritu Santo (coll.Coles); LOYALTY IS: Lifu I (AMS; USNM); NEW CALEDONIA: (USNM); Bourail; Baie des Citrons, Noumea (both AMS); FIJI IS: Suva reef, Viti Levu (coll.Powell); Caboni Beach, N.Viti Levu (coll.Eker); E. of Sigatoka, Viti Levu; W. of Rat Tail Passage, Suva reef; Malolo I and Malevu reef, both Mamanuca group; Yadua I, off Lautoka (all coll.Marrow); S. of Cave I, Suva Bay; 15 km E. of Bau I, S.Viti Levu; Vura I, Gt.Astrolabe reef, 18°52'S & 178°30'E (all ZMC); near Wakaya I, Ovalau I; Moce I and Lakeba I, both Lau group (all AIM); Ogea I (coll.Wade); Watia wharf, N.W.Viti Levu (coll.Bratcher); SAMOA IS: Vailele Beach; off Toba Pt., Upolu (both coll.Powell); Apia, Upolu (ZMC); off Fuailala, Upolu I; Pago Pago; Tutuila I; Apia (all USNM); Apia Harbour (coll.Scott); TONGA IS: Niuafobutabu, 15°58'S & 173°48'W (ZMC); COOK IS: Rarotonga (ZMC).

According to Pease (1868), Dunker informed him that the locality for *N.albescens* given as "West Indies" was probably incorrect since Dunker received the species from the East Indies. E.A.Smith (1879b) reported the species from the Hawaiian Is, but Kay (1979) does not list the species from there, and no specimens have been seen in Museums or collections east of the Cook Is.

Nassarius (Niotha) albescens gemmuliferus (A.Adams, 1852)
(Plate 8, figs. 2-4)

1852. *Nassa gemmulifera* A.Adams, Proc.Zool.Soc.Lond. Pt.19:99; 1853 Reeve, Conch.Icon. 8:pl.20, figs.132a,b; 1879 E.A.Smith, Proc.Zool.Soc.Lond. p.809.
1853. *Nassa isabellei* Reeve, Conch.Icon. 8:pl.7, fig.47 (non d'Orbigny, 1841).
1877. *Nassa fenistrata* Marrat, Prop.new forms genus *Nassa* p.10 (nom.subst.pro *N.isabellei* Reeve, 1853).
1879. *Nassa albescens* Dunker, E.A.Smith, Proc.Zool.Soc.Lond. p.809; 1887 v. Martens, J.Linn.Soc.Lond. 21:181.
1882. *Nassa fenestrata* Marrat, Tryon, Man.Conch. 4:51, pl.16,fig.281 (emended spelling); 1959 Barnard, Ann.Sth.Afric.Mus. 45:111; 1960 Barnard, Ann.Sth.Afric.Mus. 47:textfig.14b (radula); 1973 Kensley, Sea-shells Sth.Afric. p.160,fig.593.
1898. *Nassa (Niotha) fenestrata* Marrat, Melvill & Sykes, Proc.Malac.Soc.Lond. 3:38; 1929 Dautzenberg, Faune Colon.Franc. 3:414.
1901. *Nassa (Niotha) albescens* var. *fenestratus* Marrat, Melvill & Standen, Proc.Zool.Soc.Lond. 2:412.
1928. *Nassarius (Niotha) fenestratus* Marrat, Melvill, Proc.Malac.Soc.Lond. 18:106; 1930 Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:49.
1930. *Nassarius (Niotha) fenestratus* var. *gestroi* Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:49.
1931. *Nassarius fenestratus* Marrat, Tomlin, J.Conch. 19:107 (synonymised with *Nassa gemmulifera* A.Adams).
1942. *Nassa stigmaria* A.Ad., Fischer-Piette, J.Conchyl. 85:214, pl.5,figs.8,8a (figd. type of Adansons "Le Totombo") [non A.Adams, 1852].
1972. *Nassarius (Niotha) albescens gemmuliferus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:146, figs.45,46 (shell), fig.60 (radula).
1982. *Nassarius albescens gemmuliferus* (A.Adams), Kaicher, Card cat.world-wide shells, Pack No.31: card 3136.

The Western Indian Ocean subspecies *gemmuliferus* differs from the nominate subspecies in the following features: The sculpture is coarser in *gemmuliferus*, particularly on the body whorl where axial ribs number from 20-25; the majority of specimens have intermediate narrow fillets which separate the main rows of gemmules on the body whorl. The protoconch is glassy-white or cream and all post-embryonic whorls lack the violet or purplish-brown colouring of the Pacific *albescens*. The body whorl is usually banded with brown and the interior of the aperture is banded with purple-brown. The operculum is brown and serrate at the margins.

TYPE LOCALITY. Burias I, Philippines, 11 m = error! *(gemmuliferus)*; none *(isabellei* Reeve; *fenestrata)*; Massawa, Red Sea, 11 m; Archico; Arafali, 10 m; Rathmat *(gestroi)*. Mauritius is here designated as the type locality of *N.albescens gemmuliferus* (specimens in AIM, AMS and ZMC).

DISTRIBUTION. From the Red Sea and the Persian Gulf to South Africa and the Andaman Is. In clean and muddy coral sand, from the intertidal zone to a depth of 33 m.

Type specimens. Two syntypes of *N.albescens gemmuliferus* (A.Adams), are in the British Museum (N.H.), London, No.197338, and the syntype measuring length 11.7 mm, width 6.8 mm, is here selected as the lectotype. (Pl.8, Fig.2) The holotype of *N.fenestratus* var. *gestroi* Bisacchi, length 14.0 mm, is in the Museo Civico Storia Naturale, Genova. The type of *Nassa fenestrata* Marrat (and of *N.isabellei* Reeve), has not been located.

Material examined. RED SEA: Dahlak Archipelago, 15°08'N & 40°18'E, 9 m; Dahab; Eilat, Gulf of Aqaba; Museri I; Hawakil Bay, Eritrea, 13°17'N & 40°20'E, 18-24 m; Nuweiba; Ras Muhamad; Marsa el Ef, Gulf of Aqaba; N.of Fara'un I; N.of Taba, Gulf of Aqaba; Sharm-el-Moya, Gulf of Aqaba; Marsa-el-Murach, Gulf of Aqaba (all TAU); Jiddah Harbour (USNM); PERSIAN GULF: Pearl Banks, 3 km S.S.E. of Quais I, 3-4 m; N.E. of Bahrein, 26°38'N & 51°03'E, 20 m; 4 km E.S.E. of Bustani, 5-6 m; Stiffe's Bank, 26°27'N & 53°08'E, 33 m (all ZMC); Tarut Bay (coll.Powell); Masirah I (coll.Rogers); Ras Tanura (USNM); EAST AFRICA: Raskamoni reef, Dar-es-Salaam (coll.Eker); Kepwani, 2 km N. of Uzi I, S.W. Zanzibar; Chwaka village, E.Zanzibar (both AIM); Tiwi River, S. of Mombassa (ZMC); near Mombassa, Kenya (USNM); Dissei I, Ethiopia, 2 m (Natal Mus.); MADAGASCAR: Pt.Fievre, S. of Nossi-Be (AIM); Tulear (SMOM); Nossi-Be (USNM); SOUTH AFRICA: Durban, Natal (AIM; USNM); SEYCHELLES IS: (USNM); Bay Ternay, Mahe I (coll.Dale); MAURITIUS: Graved Bay; Black River, 9-18 m; Cannonier's Pt. (all ZMC); Flic-Flac (AIM); Arsenal Bay (AMS); REUNION I: Lagon de la Saline (coll.Martin); INDIA: Indian Seas (ZSI); South India (ZSI); ANDAMAN IS: (AMS; USNM; ZSI).

Nassarius (Niotha) acteon MacNeil, 1960
(Fig. 109)

1960. *Nassarius (Niotha) acteon* MacNeil, U.S.Geol.Surv.Prof.Pap. No.339:81, pl.3, fig.30.

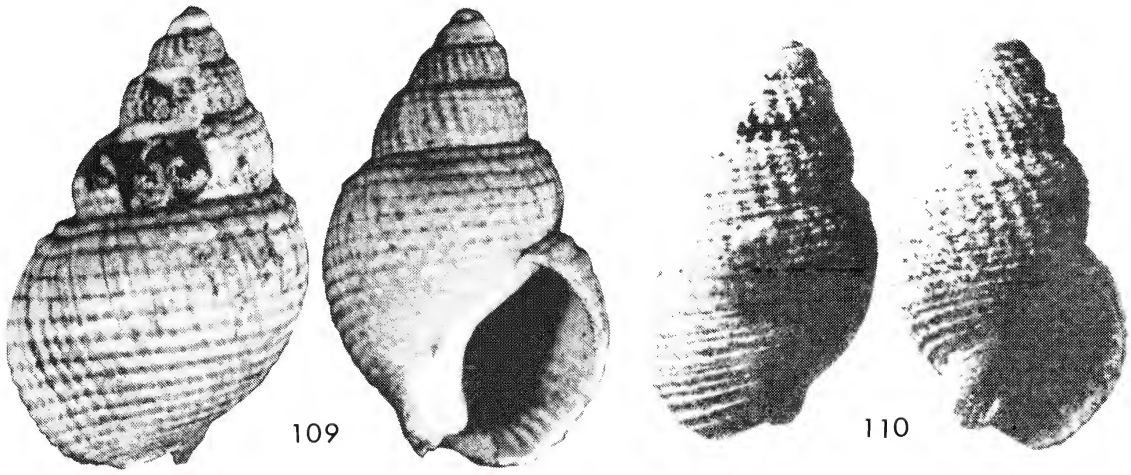
Shell 9.5 mm in length, ovate, immature, teleoconch of 3¾ whorls, protoconch of *c.*1½ smooth embryonic whorls; sculptured with irregular, weak and slanting axial riblets on post-embryonic whorls, riblets becoming growth-striae on body whorl; spiral sculpture consists of *c.* 6 spiral grooves on the

penultimate and 14-15 on the body whorl, two spiral cords anterior to sutures more prominent. Aperture open, lirate within, outer lip incomplete, columella concave, callus narrow and adpressed, columella with a single fold basally, siphonal fasciole corded.

TYPE LOCALITY. Yonabaru clay member, Okinawa, Miocene of the Ryukyu Is.

DISTRIBUTION. Miocene of the Ryukyu Is.

Type specimens. The holotype of *N.acteon* MacNeil, is in the National Museum of Natural history, Washington. No.USNM-562705, length 10.7 mm, width 6.0 mm.



Figs. 109, 110. Fossil Nassariinae. 109. *Nassarius (Niotha) acteon* (MacNeil). Holotype USNM-562705; 10.7mm. 110. *N. (N.) congrua* (Yokohama). Type-figure; 8.7 mm (from Yokoyama 1926, pl.41, fig.18).

Nassarius (Niotha) congrua (Yokoyama, 1926)
(Fig. 110)

1926. *Nassa (Niotha) congrua* Yokoyama, J.Fac.Sci.Imp.Univ.Tokyo 1(9):339, pl.41, fig.18.

"Shell small, ovate. Whorls about five, rapidly growing, convex, longitudinally and spirally corded with the cross-points of the cords tuberculate. Longitudinal cords many, about 22 on the penultimate whorl, rounded, narrower than interspaces, straight, oblique, becoming indistinct on the last part of the body whorl. Spiral cords about seven on the penultimate and one or two more on the ultimate, rounded, with a finer, intercalary always on the latter, rarely on the former. Aperture subovate, pointed behind. Outer lip thin, sharp, transversely costate within. Inner lip with a layer of glaze, which is marked off from the base by a groove; the lower end bent outward so as to form a sharp ridge. Canal short, bent. A single example measuring 8.7 mm in height and 5.0 mm in diameter." (Original description).

TYPE LOCALITY. Asuka, southern Totomi, Satsuka beds, Pliocene of Japan.

DISTRIBUTION. Pliocene of Japan.

Type specimens. Probably in the Geological Department, University of Tokyo. The species closely resembles immature specimens of *N.albescens albescens* (Dunker).

Nassarius (Niotha) candens (Hinds, 1844)
(Plate 8, figs. 5-7)

1844. *Nassa candens* Hinds, Zool.Voy.H.M.S. "Sulphur" p.35,pl.9,figs.6,7; 1853 Reeve, Conch.Icon. 8:pl.6, figs.39a,b.
1933. *Nassa (Niotha) candens* (Hinds), Dautzenberg & Bouge, J.Conchyl.77:211.
1975. *Nassarius candens* (Hinds), Salvat & Rives, Coquill.Polynésie p.321,fig.232.
1978. *Nassarius (Niotha) candens* (Hinds), Cernohorsky, Trop.Pacific mar. shells p.81, pl.24,fig.7.

Shell up to 21.0 mm in length, elongate-ovate, spire pointed, teleoconch of 5½-6¼ weakly convex whorls, protoconch of 3-3¼ milky-white, finely carinate embryonic whorls; sculptured with numerous axial riblets which are bisected by overriding spiral threads to give the shell an over-all granulose appearance; two rows of nodules anterior to sutures doubled up, spaces between main rows of nodules with 1-3 finer, intermediate spiral threads. Aperture moderately narrow, interior of aper-

ture prominently lirate, columellar callus spreading onto body whorl, lower half of columella denticulate or wrinkled, siphonal and anal canals prominent. Base colour white, variously banded or streaked with dark tan or reddish-brown, columellar callus and aperture white, remnants of brown bands on body whorl forming 2-3 brown blotches towards the back of the outer lip. Operculum brown and with only 1-2 denticles on margins.

TYPE LOCALITY. Marquesas Is.

DISTRIBUTION. From the Society Is to the Marquesas Is, French Polynesia. In coralline sand, from the intertidal zone to a depth of 5 m.

Type specimens. Three syntypes of *N.candens* (Hinds) are in the British Museum (N.H.), London No.1844.9.23.1-2., and the syntype measuring length 20.0 mm, width 11.2 mm, is here designated as the lectotype (Pl.8,figs.5,6).

Material examined. SOCIETY IS: Tahiti (AMS; USNM); MARQUESAS IS: (AMS; USNM); Bay N.W. of Tahuata I (coll.Bratcher and Dillworth); Taiohae, Nukuhiva, 5 m (ZMC); Nukuhiva (coll.Trondle).

It appears that *N.candens* replaces *N.albescens albescens* (Dunker) in French Polynesia.

Nassarius (Niotha) splendidulus (Dunker, 1846)
(Plate 8, figs. 8-13; Plate 9, figs. 1,2).

1846. *Buccinum splendidulum* Dunker, Zeit.f.Malakozool. 3:170; 1849 Philippi, Abb.Beschr.Conchyl. 3:pl.2,fig.16.
1852. *Nassa stigmaria* A.Adams, Proc.Zool.Soc.Lond. Pt.19:96; 1853 Reeve, Conch.Icon. 8:pl.7,figs.42a,b; 1876 E.A.Smith, J.Linn.Soc.Lond. 12:544; 1879 E.A.Smith, Proc.Zool.Soc.Lond. P.808; 1934 Mari, J.Conchyl. 78:29.
1854. *Nassa densigranata* Reeve, Conch.Icon. 8:pl.27, fig.181; 1885 Cooke, Ann.Mag.Nat.Hist. (5), 15:327; 1934 Mari, J.Conchyl. 78:26.
1877. *Nassa (Niothia) desigranata* (Reeve), Brazier, Proc.Linn.Soc.N.S.W. 1:179.
1877. *Nassa nivosa* Marrat, Prop.new forms genus *Nassa* p.9.
1877. *Nassa praecallosa* Marrat, Prop.new forms genus *Nassa* p.11.
1879. *Nassa (Niotha) stigmaria* (A.Adams), E.A.Smith, Proc.Zool.Soc.Lond. p.211; 1886 Watson, Repts.Sci.Res.Voy.H.M.S."Challenger" 15:178; 1897 Melvill & Sykes, Proc.Malac.Soc.Lond. 2:169;1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:412.
1880. *Nassa granulosa* Marrat, Var.shells genus Nassa pp.54,80 (spelled *granulata* on p.87).
1895. *Nassa (Niotha) densigranata* (Reeve), Melvill & Standen, J.Conch. 8:107; 1911 Schepman, Siboga-Exped. 49d:327.
1897. *Nassa (Niotha) splendidula* (Dunker), Melvill & Standen, J.Conch. 8:407; 1911 Schepman, Siboga-Exped. 49d:326; 1955 Marche-Marchad, J.Conchyl. 95:34.
1928. *Nassarius (Niotha) stigmarius* (A.Adams), Melvill, Proc.Malac.Soc.Lond. 18:106.
1930. *Uzita densigranata* (Reeve), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:66.
1936. *Niotha hawleyi* Iredale, Rec.Austral.Mus. 19:322, pl.24,fig,11; 1962 Iredale & McMichael, Austral.Mus.Sydney Mem. No.11:67.
1952. *Alectrion splendidulus* (Dunker), Tinker, Pacific Sea shells p.82,fig. top centre facing plate.
1961. *Niotha stigmaria* (A.Adams), Habe, Col.illust.shells Japan 2:64, pl.32, fig.13.
1964. *Niotha stigmaria ravida (sic)* (A.Adams), Habe, Shells west.Pacific col. 2:99, pl.32,fig.13 (non *Nassa ranida* A.Adams, 1852).
1966. *Niotha cumingii* (A.Adams), Habe & Kosuge, Shell world col. 2:61, pl.22, figs.18,19 (non *Nassa cumingii* A.Adams, 1852).
1977. *Nassarius splendidulus* (Dunker), Salisbury, Hawaiian Shell News 25(2):5, fig.3.
1978. *Nassarius (Niotha) splendidulus* (Dunker), Cernohorsky, Trop.Pacific mar.shells p.238, pl.24,fig.24.
1979. *Nassarius crematus* (Hinds), Kay, Hawaiian mar.shells p.272, fig.95F (non *Nassa cremata* Hinds, 1844).

Shell up to 23.0 mm in length but usually only half this size, shining, elongate-ovate, teleoconch of 4-6 convex whorls, protoconch of 3-3¼ glassy-white or cream embryonic whorls, sutures frequently narrowly canaliculate; sculptured with quadrate nodules which are arranged in axial ribs and bisecting spiral grooves, sculpture either coarse or fine, depending on the number of axial ribs, sutural nodules occasionally formed on last two whorls. Aperture moderately open, outer lip denticulate – lirate, size of columellar callus variable and either narrow or spreading across body whorl and almost reaching body whorl suture in rare individuals but always thinning above parietal wall, columella denticulate. White, cream or fawn in colour, sparsely or prominently banded, streaked or variegated with brown, occasional specimens with a few brown sutural spots, aperture and columellar callus white. Operculum brown and either distinctly multi-serrate or with only 1-2 denticles on margins.

The animal is white, spotted with black.

TYPE LOCALITY. None *(splendidulus; nivosa; praecallosa)*; Siquijor I, Philippines *(stigmaria)*; Philippines *(densigranata; granulosa)*; Sydney Harbour, Australia *(hawleyi)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf through the tropical Indo-Pacific to the Society and Hawaiian Is. In coralline and weedy sand, from the intertidal zone to a depth of 200 m.

Type specimens. Two syntypes of *N.splendidulus* (Dunker) are in the Zoological Museum, Humboldt University, Berlin, length 15.8 mm and 10.9 mm respectively. The holotype of *Nassa stigmaria* A.Adams, is in the British Museum (N.H.), London, No.1973117, length 20.2 mm. Three syntypes of *N.densigranata* Reeve are in the same Institution, No.197333, and the specimen measuring length 13.1 mm, width 6.5 mm, is here designated as the lectotype (Pl.8,fig.11). Two faded syntypes of *N.nivosa* Marrat, are in the Merseyside County Museum, Liverpool, and the specimen measuring length 11.6 mm, width 7.1 mm is here selected as the lectotype (Pl.8,fig.13). The holotype of *N.praecallosa* Marrat, which is in the same Institution, length 12.4 mm, is an individual with an abnormally enlarged columellar callus. Three syntypes of *N.granulosa* Marrat, are also in the Merseyside County Museum, Liverpool, and the brightly coloured syntype, length 9.8 mm, width 5.3 mm, is here selected as the lectotype (Pl.8,fig.12). The holotype of *Niotha hawleyi* Iredale, is in the Australian Museum, Sydney, No. C-60689, length 13.7 mm.

Material examined. RED SEA: off Mersat Abu Samra, 51-53 m; Taba, Gulf of Aqaba (both TAU); S. side of Dissel I, 25 km off Massena, 4-5 m (AMS); PERSIAN GULF: Manama (coll.Mason); EAST AFRICA: Isle du Lys, Glorieuses Is, Comoro Is, 26 m (MNHNP); MADAGASCAR: Tulear (SMOM); ANDAMAN IS: (ZSI; ZMC); THAILAND: Koh Mak, 9-11 m (ZMC); INDONESIA: Doe Roe, Kai Is, Moluccas, 40 m; Saparoea Bay, Kei-Oerne I, Kai Is, 19-88 m; Tocal, Kei-Oerne, Kai Is; Amboina Bay, 13-18 m (ALL ZMC); off Doelah, Kai I, 50 m (coll.Brennan); N. of du Rowa, Nuhu Rowa, Kai Is, 33-37 m; off Tg Tutuhuhur, Piru Bay, Ceram I, 26-55 m; 13 km S.W. of Tg Ratoe, Maikoor, Aru Is, 46 m (all WAM); 48 km E. of Bali (coll.Schlotheim); PHILIPPINES: Jolo, *c.*27 m (ZMC); off N.E. Burias, 37 m; Jolo, 42 m (both USNM); Ata I, 2 km W. of Kawayan, Marinduque (AMS); Punta Engano, Mactan I, Cebu, 200 m (coll.Marrow); Tinakta I, Tawi Tawi group (coll.Norton); CAROLINE IS: Ant Atoll (LACM); Sapcheck I, Ponape (SDMNH); MARIANAS IS: Rizal Beach, Guam I (coll.Salisbury); WEST IRIAN: N.W. Rani I, Schouten I, 6 m (coll.Powell); PAPUA NEW GUINEA: Madang (coll.Bratcher); Rabaul, New Britain (coll.Prior); Laing I, Hansa Bay, 45-60 m (coll.Tursch); AUSTRALIA: Northern Territory: Yirrkalla, Arnhem Land (AMS); Queensland: Big Sandy Cay, Swains reef; Lady Musgrave I, Bunker group; Lizard I; Dingo Beach, S.E. of Bowen; Ellison reef, off Kurrimine near Mourilyan; Buchan's Pt. near Cairns; off Endeavour reef, 37 m; off Bowen, 46 m; Batt reef, Low Isles near Port Douglas; Cairns reef, S.E. of Cooktown; Hope I, S. of Cooktown; S.end of Fraser I, 25°48'S & 153°46'E, 73 m; Big Upolu Cay, N.E. of Cairns; Green I, off Cairns (all AMS); Hayman I, Whitsunday group (coll.Marrow); SOLOMON IS: Bonigi I, Guadalcanal, 11-21 m (coll.Dillworth); E. of Yandina, Russell I, 150-200 m (coll.Potter); NEW HEBRIDES: Teuma Bay, Efate I, 37-46 m (coll.Eker); Kakula I, Undine Bay (coll.Colardeau); LOYALTY IS: Cap des Pins, Lifu I (AMS); NEW CALEDONIA: Anse Vata, Noumea (AMS); FIJI IS: Manava I, N.off Viti Levu (coll.Eker); W. of Rat Tail Passage, Suva reef; Malolo I and Malevu reef, both Mamanuca group (all coll.Marrow); Wakaya I near Ovalau I (AIM); Akuilau I, Nadi Bay; Momi Bay, 27 m; Namotu I, Mamanuca group (all USNM); Nadi Bay (AMS); SAMOA IS: Apia (coll.Powell); Sogi, Apia, 14 m (coll.Scott); LINE IS: W. coast of Christmas I, (coll.H.M.S."Lachlan"); SOCIETY IS: Mataiea, Tahiti, 10 m; Mahina, Baie de Matavai, Tahiti, 12 m; Hitiaa, Tahiti; Pirae, Tahiti (all coll.Trondle); HAWAIIAN IS: Honolulu, 18-73 m (ZMC); Electric Beach, Oahu, 18 m (coll.Salisbury); Keehi lagoon, Oahu, 76-137 m (coll.Bratcher); S.coast of Oahu, 95 m; Keaukaha, S.coast of Molokai, 110-117 m; off Quarantine I, Honolulu, 38 m; Entrance to Honolulu Harbour, 11-15 m; off Mala Bay, 7-22 m; off Waikiki, 60-92 m; Kaneohe Bay, Oahu, 7 m (all USNM); Ewa Beach, Oahu, 11 m (coll.Katekaru); Haleiwa, N.Oahu (AMS); Pokai Bay, 92-107 m (coll.Adams); Sand I; off Kukiula, Kauai, 46 m (both coll.Haas).

Nassarius (Niotha) novaezelandiae (Reeve, 1854)
(Plate 9, figs. 3-6)

1854. *Nassa novaezelandiae* Reeve, Conch.Icon. 8:pl.28, figs.186a,b.
1873. *Nassa bifaria* Baird in Brenchley, Cruise "Curacao", p.436, pl.38, figs. 1,2; 1876 E.A.Smith, J.Linn.Soc.Lond. 12:544; 1879 E.A.Smith, Proc.Zool.Soc.Lond. p.808, pl.50,fig.7.
1899. *Nassa (Alectrion) bifaria* Baird, Melvill & Sykes, Proc.Malac.Soc.Lond. 3:221.
1946. *Nassa (Niotha) auberti* Abrard, Ann.Paleont. Paris 32:73, pl.5,figs.8,9.
1972. *Nassarius (Niotha) bifarius* (Baird), Cernohorsky, Rec.Auckland Inst.Mus. 9:143, fig.40 (shell), fig.58 (radula).
1978. *Nassarius (Niotha) novaezelandiae* (Reeve), Cernohorsky, Trop.Pacific mar.shells p.81, pl.25, figs.1,1a.
1982. *Nassarius novaezelandiae* (Reeve), Kaicher, Card cat.world-wide shells, Pack No.31: card 3188.

Shell up to 18.0 mm in length, elongate-ovate, shining, moderately light in weight, teleoconch of 5-6 weakly convex whorls, protoconch of 2¾-3 smooth, golden-brown, finely carinate embryonic whorls; sculptured with small round nodules which are arranged in axial ribs and spiral rows of

granulose cords, sculpture of last whorl variable, either prominently granulose or with only axial ribs or only obsolete axials and weak spiral threads, sutural nodules well defined. Aperture moderately open, outer lip thickened and denticulate-lirate, lower half of columella calloused and laminate, area above the parietal wall usually only glazed, anterior of columella denticulate, siphonal and anal canals distinct. White, cream to fawn in colour, ornamented with faint wavy, orange-brown streaks or banded and spotted with dark brown, aperture and columellar callus white. Operculum brown, serrate or faintly ragged at margins.

TYPE LOCALITY. New Zealand = error! *(novaezelandiae)*; New Caledonia *(bifaria)*; Nua, Malekula I, Pliocene of New Hebrides *(auberti)*. Efate I, New Hebrides, is here designated as the type locality.

DISTRIBUTION. From the Amirante Is to India, the Philippines and the Fiji Is. In clean coral, black or muddy sand, from the intertidal zone to a depth of 40 m.

Type specimens. Two syntypes of *N.novaezelandiae* (Reeve) are in the British Museum (N.H.), London, No.197353, and the specimen measuring length 13.0 mm, width 7.7 mm, is here selected as the lectotype (Pl.9,fig.3). Two syntypes of *Nassa bifaria* Baird in Brenchley, are in the same Institution, and the syntype measuring length 14.9 mm, width 8.9 mm, is here designated as the lectotype (Pl.9,fig.4). The type of *N.auberti* Abrard, is probably in the Museum National d'Histoire Naturelle, Paris.

Material examined. AMIRANTE IS: Remire I (coll.Tursch); REUNION I: Lagon de la Saline (coll.Martin); INDIA: Madras (ZSI); THAILAND: Koh Kut, 27 m (ZMC); PHILIPPINES: (USMN); PAPUA NEW GUINEA: Nordup, Rabaul, New Britain, 15-40 m (coll.Prior); Escape Bay, Rabaul, 21-24 m (coll.Parkinson); Laing I, Hansa Bay, 5-10 m (coll.Tursch); NEW HEBRIDES: Efate I (coll.Lepage); Malapoa Pt., Efate I (coll.Bratcher); Teuma Bay, Efate I (coll.Colardeau); NEW CALEDONIA: (coll.Trondle); FIJI IS: Momi Bay, Viti Levu (coll.Jennings); Manava I, N.off Viti Levu (coll.WOC).

The form *bifaria* Baird in Brenchley, occurs from India to the Fiji Is. In this form the body whorl is not as granulose as the spire whorls and is either distinctly or obsoletely axially ribbed and the lower half of the body whorl has a few spiral cords.

Nassarius (Niotha) bellus (Marrat, 1877)
(Plate 9, figs. 7-11)

1877. *Nassa bella* Marrat, Prop.new forms genus *Nassa* p.9.
1901. *Nassa (Niotha) angriasensis* Melvill & Standen, Proc.Zool.Soc.Lond. 2:412, pl.23,fig.13; 1911 Schepman, Siboga-Exped. 49d:328.
1925. *Nassa perligera* Thiele, Wiss.Ergeb.deut.Tief.-Exped."Valdivia" 17:259, pl.20, fig.13.
1972. *Nassarius (Zeuxis) concinnus* (Powys), Cernohorsky, Mar.shells Pacific 2:151, pl.44,fig.7 (non *Nassa concinna* Powys, 1835).
1978. *Nassarius (Niotha) bellus* (Marrat), Cernohorsky, Trop.Pacific mar.shells p.85, pl.26,fig.6.

Shell up to 14.0 mm in length, elongate-ovate, light in weight, teleoconch of 4½-5 convex whorls, protoconch of 3¼-3¾ glassy, golden, finely carinate embryonic whorls; sculptured with axial riblets which number from 15-26 on the penultimate and from 12-21 on the body whorl, ribs crossed by fine or coarse spiral threads which form prominent or weak nodules upon the axial ribs, sutural nodules well defined; penultimate whorl with 4-6 spiral rows of nodules, body whorl with 12-14 and additional 5-7 fine threads on the siphonal fasciole. Aperture narrow, outer lip thickened and with 9-12 denticles, columellar callus slightly spreading onto body whorl and frequently thinning above parietal wall and laminated anteriorly, columella with 4-9 denticles, siphonal and anal canals distinct. Base colour white to pale grey, spire whorls with a single brown band across sutural nodules, body whorl with 3 brown bands, aperture and columellar callus white. Operculum brown, serrate or ragged at margins.

TYPE LOCALITY. None *(bellus)*; Angrias Bank, Arabian Sea, India *(angriasensis)*; Padang, Sumatra, Indonesia and Upolu, Samoa Is *(perligera)*. Pidjot Bay, Lombok, Indonesia, is here designated as the type locality (specimens in ZMA).

DISTRIBUTION. From Madagascar to India, the Ryukyu Is and Samoa Is. In green and black sand, mud and clay, subtidal, from 18-129 m.

Type specimens. The holotype of *N.bellus* (Marrat) is in the Merseyside County Museum, Liverpool, length 12.3 mm. The holotype of *Nassa angriasensis* Melvill & Standen, is in the British Museum (N.H.), London, No. 1901.12.9.136, length 10.4 mm, and the holotype of *N.perligera* Thiele, is in the Zoological Museum, Humboldt University, Berlin, length 9.5 mm.

Material examined. MADAGASCAR: Tulear (SMOM); INDIA: Between Sri Lanka and Calcutta, 20°37'N & 87°33'E, 68 m; off Tranquebar, 11°06'N & 80°05'E, 129 m (both ZMC); Angrias Bank, S.S.W. of Bombay (BMNH); ANDAMAN IS: (ZMC); THAILAND: Koh Kam, 18 m (ZMC); INDONESIA: Bay of Pidjot, Lombok, 22m; Kulewatti Bay, Dammer I, 45 m (both ZMA); between Java and Sumatra, 6°42'S & 105°17'E, 42 m; Amboina Bay, 92 m (both ZMC); Carita Beach, N. of Labuan, W.Java (coll.McCausland); RYUKYU IS: Seragaki, Okinawa I (coll.Deynzer); PAPUA NEW GUINEA: Laing I, Hansa Bay, 35 m (coll.Tursch); NEW HEBRIDES: Teuma Bay, Efate I, 37-46 m (coll.Colardeau); FIJI IS: Suva reef, S.Viti Levu (coll.Northgrove); between Nabila and Navula lights, Momi Bay, W.Viti Levu, 24-27 m (coll.Jennings).

Nassarius (Niotha) livescens (Philippi, 1849)
(Plate 10, figs. 1-12)

1849. *Buccinum livescens* Philippi, Zeit.f.Malakozool. 5:135.
1852. *Nassa sordida* A.Adams, Proc.Zool.Soc.Lond. Pt.19:97; 1853 Reeve, Conch.Icon. 8:pl.15, fig.96.
1853. *Nassa marginulata* Reeve, Conch.Icon. 8:pl.7,fig.4; 1887 v.Martens, J.Linn.Soc.Lond. 21:181 (non *Buccinum marginulatum* Lamarck, 1822 = *Nassarius*).
1853. *Nassa margaritifera* Reeve, Conch.Icon.8:pl.9, figs.59a,b (non *Buccinum margaritiferum* Dunker, 1847 = *Nassarius*).
1854. *Nassa deshayesii* Rousseau, Voy.Pole Sud, Zool.5:76, pl.21,figs.11,12.
1861. *Nassa livescens* Philippi, Dunker, Moll.Japonica p.7; 1871 Lischke, Japan.Meeres-Conchyl. 2:52, pl.4,figs.1-3; 1874 Tapparone-Canefri, Mem. R.Accad.Sci.Torino (2), 28:122; 1882 Tryon, Man.Conch. 4:54, pl.16, fig.304; 1882 Dunker, Index Moll.Japonici p.35; 1907 Schepman, Samml.geol.Reichs-Mus.Leiden (1), 8:174.
1863. *Nassa kieneri* Deshayes, Cat.Moll.ile Reunion p.129 (nom.subst.pro *N.marginulata* Reeve, 1853, pl.7,fig.4); 1885 Cooke, Ann.Mag.Nat.Hist. (5), 15:327; 1919 K.Martin, Paleozool.Kennt.Java p.83; 1928 K.Martin, Weten.Meded.Mijnb.Ned.-Indie No.10:9 (non *Buccinum kieneri* Anton, 1838 = *Nassarius*).
1870. *Niotha livescens* (Philippi), A.Adams, Ann.Mag.Nat.Hist. (4), 5:425; 1967 Habe & Kosuge, Stand.book Jap.shells col. 3:76, pl.29,fig.36; 1973 Habe, Ann.Rept.Noto Mar.Lab. 13:21.
1871. *Nassa gracilis* Pease, Lischke, Jap.Meeres-Conchyl. 2:52, pl.4,figs.4-6 (non Pease, 1868).
1877. *Nassa oblonga* Marrat, Prop.new forms genus *Nassa* p.5 (non *Buccinum oblongum* Sassi, 1827 = *Nassarius*; nec *Nassa oblonga* Moerch, 1852).
1877. *Nassa keenii* Marrat, Prop.new forms genus *Nassa* p.15.
1880. *Nassa lyraeformis* Marrat, Var.shells genus *Nassa* pp.49,79.
1886. *Nassa (Niotha) sordida* (A.Adams), Watson, Rept.Sci.Res.Voy.H.M.S. "Challenger" 15:178; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:412.
1891. *Nassa secluza* Fischer, Bull.Soc.d'Hist.Nat.Autun 4:143 (nom.subst.pro *N.kieneri* Deshayes, 1863 and *N.marginulata* Reeve, 1853, pl.7,fig.43); 1906 Dautzenberg & Bouge, J.Conchyl. 53:391.
1891. *Nassa provulgata* Fischer, Soc.d'Hist.Nat.Autun 4:143 (nom.subst.pro *N.margaritifera* Reeve, 1853).
1895. *Nassa (Niotha) livescens* (Philippi), Pilsbry, Cat.Mar.Moll.Japan p.35; 1898 Melvill & Sykes, Proc.Malac.Soc.Lond. 3:38; 1916 Preston, Rec. Indian Mus.Calcutta 12:89; 1929 Dautzenberg, Faune Colon.Franc. 3:414.
1903. *Nassa (Niotha) kieneri* Desh., Sturany, Denk.k.Akad.Wiss.math.-nat. Wien 74:244.
1911. *Nassa (Niotha) granosocostata* Schepman, Siboga-Exped. 49d:325, pl.20, fig.5.
1929. *Nassarius livescens* (Philippi), Taki, Venus:Jap.J.Malac. 1:114, textfig.21; 1936 Hirase, Coll.Jap.shells ed.5:75, pl.106,fig.8; 1938 Hatai & Nisiyama, Bull.Biol.Soc.Japan 8:269; 1957 Amio, J.Shimonozeki Coll.Fish.6:276, fig.2 (egg-capsules and larvae); 1974 Dance, Encycl.shells p.157, fig.top left column; 1982 Kaicher, Card cat.world-wide shells, Pack No.31: card 3178.
1930. *Nassarius (Niotha) kieneri* (Deshayes), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genoa 55:51.
1935. *Nassarius (Niotha) secluzus* (Fischer), Oostingh, Weten.Meded.Mijnb.Ned.-Indie No.26:77.
1946. *Nassarius (Niotha) livescens* (Philippi), Habe, Venus:Jap.J.Malac.14:196, textfig.17 (radula); 1954 Kira, Col.Illust.shells Japan 1:56, pl.28,fig.17; 1961 Hayasaka, Sci.Repts.Tohoku Univ.Sendai (2), Geol.33(1):86, pl.11,figs.6a,b; 1972 Cernohorsky, Rec.Auckland Inst.Mus.9:143, figs.41,42 (shell), fig.61 (radula).
1950. *Nassarius (Niotha) cf. livescens* (Philippi), Beets, Leidse Geol.Meded. 15:247.
1960. *Nassarius (Niotha) fulleri* MacNeil, U.S.Geol.Surv.Prof.Pap. No.339:80, pl.13,figs.27,28.
1961. *? Nassarius costatus* (A.Adams), Habe, Illust.shells Japan col. 2:63, pl.32,fig.9 (non *Nassa costata* S.V.Wood, 1848; nec A.Adams, 1852).
1972. *Nassarius (Plicarcularia) sordidus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:137, fig.26 (shell), fig.29 (radula).
1974. *Nassarius kieneri* Deshayes, Dance, Encycl.shells, p.156, fig.bottom right column.

Shell up to 27.0 mm in length, elongate-ovate, teleoconch of 5-7 convex whorls, protoconch of 2¼-3 glassy-brown to purple, finely carinate embryonic whorls, sutures narrowly ledged or even canaliculate; sculptured with few or numerous, slender axial ribs which continue all the way to the back of the outer lip without becoming obsolete; spiral sculpture consists of finely incised, short spiral grooves or deeper, encircling grooves which cut axials into nodules, sutural nodules well defined by

a somewhat deeper presutural groove. Aperture moderately open, outer lip thickened and denticulate-lirate, size of columellar callus very variable, usually roundly angular and thinning and concave above parietal wall, but sometimes large and spreading and almost reaching body whorl suture, columella plicate, siphonal and anal canals distinct. White to fawn in colour, irregularly banded with brown, some specimens brown and banded with white, aperture white, banded with purple-brown. Operculum brown and serrate at margins.

TYPE LOCALITY. Manila, Philippines *(livescens)*; Ilo Ilo, Panay I, Philippines *(sordida)*; Mediterranean = error! (*marginulata* Reeve); Amboina, Indonesia *(deshayesii)*; Reunion I *(kieneri)*; none *(oblonga)*; Philippines *(keenii)*; China *(lyraeformis)*; Singapore, Malaysia *(quadrata)*; Kampot, Gulf of Thailand *(provulgata; secluza)*; Kambaragi Bay, Tanah Djampeah, Indonesia, 32 m *(granosocostata)*; Chinen Sand, Okinawa, Pliocene of Ryukyu I *(fulleri)*.

DISTRIBUTION. From India to Japan and Papua New Guinea. In coral and muddy sand, eel-grass and mangroves, from the intertidal zone to a depth of 104 m.

Type specimens. The type of *N.livescens* (Philippi), could not be located, and it is not among Philippi's material at the Zoological Museum, Humboldt University, Berlin (Dr.R.Kilias, *in litt.*). The species has been elucidated by Lischke (1871), who had access to Philippi's collection and type material at the time, and his illustrations (pl.10,fig.1) is the *N.livescens* of all authors. The following type-specimens are in the British Museum (N.H.), London: three syntypes of *Nassa sordida* A.Adams, No.1973124, and the syntype measuring length 13.4 mm, width 7.5 mm, is here selected as the lectotype (pl.10,fig.2); three syntypes of *N.marginulata* Reeve [non Lamarck] (no number) [also the type of *N.kieneri* Deshayes and *N.secluza* Fischer], and the specimen measuring length 19.0 mm, width 12.4 mm, is here designated as the lectotype (pl.10,fig.3); three syntypes of *N.margaritifera* Reeve (non Dunker) [also the types of *N.provulgata* Fischer], and the specimen illustrated by Reeve (1853) and measuring length 26.4 mm, width 15.4 mm, is here selected as the lectotype (pl.10,fig.5); the holotype of *N.deshayesii* Rousseau, is in the Museum National d'Histoire Naturelle, Paris, length 25.0 mm, width 14.8 mm. The following types are in the Merseyside County Museum, Liverpool: the holotype of *N.oblonga* Marrat, length 25.0 mm, width 14.0 mm; three syntypes of *N.keenii* Marrat, and the specimen measuring length 13.0 mm, width 8.5 mm, is here selected as the lectotype (pl.10,fig.8); the holotype of *N.lyraeformis* Marrat, length 22.4 mm, width 14.8 mm; two syntypes of *N.quadrata* Marrat, and the specimen measuring length 20.2 mm, width 13.0 mm, is here designated as the lectotype (pl.10,fig.10); the holotype of *N.granosocostata* Schepman, is in the Zoological Museum, University of Amsterdam, length 16.2 mm, width 8.8 mm, and the holotype of *Nassarius fulleri* MacNeil, is in the National Museum of Natural History, Washington, No.USNM-562949 (old No. USGS-17495), length 15.0 mm, width 9.7 mm.

Material examined. INDIA: Krusadai Is (ZMC); MALDIVE IS: (ZSI); SRI LANKA: (USNM); NICOBAR IS: (ZSI); THAILAND: E.side of Ko Phuket; Koh Chang, 9 m (both ZMC); Lem Sing; Singora, Gulf of Thailand; Koh Chang; Sichol, Gulf of Thailand; Bangbert Bay, Gulf of Thailand; Khan Nu, Patham, Gulf of Thailand (all USNM); Ao Nam Bor, Phuket; Ko Sire I, Phuket (both PMBC); MALAYSIA: Pulau Penang, W.coast of Malaya; S.coast of Pulau Tekong, N.E. of Singapore; Singapore (all ZMC); Siglap, Singapore (coll.Powell); Kampong Loyang, Singapore; Bedok Beach, Singapore (both USNM); Pulau Langkawi, Kedah; Batu Ferringhi, Penang (both coll.McCausland); Tg Aru, Sabah (AIM); INDONESIA: Amboina; Sandakan, N.Borneo (both coll.Powell); Harrison hotel Beach, Ancol.Jakarta; Pangkat village, N.E. of Bangka I, Sumatra; Pasir Putih near Panjang, Lampung Province, Sumatra; Balikpapan, E.Kalimantan, Borneo; Kupang, W.Timor; Carita Beach, N.of Labuan, W.Java; W.end of Teluk Kao, Halmahera, Malacca (all coll.McCausland); Kudak Bay, N.Borneo; Keledjitan, Bantam, Java; Sandakan, N.Borneo (all USNM); Kei-Oerne, Kai Is, c.20 m; Pulo Babo, S.Java, 5°54'S & 106°12'E, 24 m (both ZMC); Tanjong Aru, Sabah, N.Borneo (coll.Richardson); PHILIPPINES: Bohol; Zamboanga, Mindanao; Manila (all ZMC); Dungaree Beach, Subic Bay (coll.Salisbury); Mindanao; Pasai, Rizal Prov., Luzon; Manila Bay, Luzon; Zamboanga, Mindanao; Tubajon Bay, Dinagat, 10°20'N & 125°32'E; Ulugan Bay, Palawan group; Ilo Ilo, Panay I; Tilig, Lubang I; Mariveles Bay, Luzon; Manjan, Mindoro; Port Binang, Subic Bay, Luzon; Pasacao, Luzon; Guijulugan, Negros; Ragay Bay, Luzon (all USNM); KOREA: 33°10'N & 128°51'E, 98 m (AIM); CHINA: Hongkong (AMS; LACM: USNM); Lanima I near Hongkong (USNM); Stanley Bay, Hongkong (coll.Orr); Tai Tan Harbour and Lantao I, Shiu Hao, both Hongkong; Tolo Harbour, New Territories (all Auckland Univ.); RYUKYU IS: Kue Channel, Okinawa (Auckland Univ.); JAPAN: Kakoshima Bay (coll.Powell); Aburatsubo, Misaki (ZMC); Nagai, Sagami Bay (coll.Marrow); Imazumi, Satsuma; Otaru; Hirado, Hizen; Fukura, Awaji; Yenoshima; Wakanura, Kishiu; Mogi; off Hondo, 68 m at 66.6°F (19°C); Bungo Channel, 71 m at 68°-70° (20°-21°C); Kagoshima; off Honshu I, 104 m; Kii; Yenoshima; Yokohama; Tarugashima; Higo; Kishiu; Funagawa; Nagasaki (all USNM); Tosa, 45 m; Kominato, Boshiu, Hondo I (both AMS); CAROLINE IS: Passage W. of Koror I, Palau Is (coll.Powell); Palau Is (USNM); Arakabesan I near Koror I, Palau Is (coll.McCausland); WEST IRIAN: Aoe I, Geelvink Bay (USNM); PAPUA NEW GUINEA: Hermit group (AMS).

Fossil record. Pliocene: Naganuma near Yokohama, Japan (NZGS); Chinen Sand, Okinawa, Ryukyu Is (USNM); Sonde and Padasmalang, Java, Indonesia; Atjeh and Obi I, Timor (both Oostingh 1935); PLEISTOCENE: Celebes, Indonesia (Schepman 1907).

Due to its high degree of variability, the species had a very confused taxonomic history and received no fewer than 13 names in the process. The 2 characters most liable to variation are the number and thickness of the axial ribs and size of the columellar callus. In the typical form of *livescens* the callus reaches about half way up the body whorl, whereas in the *quadrata* form (erroneously known as *N.sordidus* A.Adams), the callus almost reaches the body whorl suture. The lectotype of *"N.margaritifera* Reeve" (= *provulgata* Fischer) has a small callus, but one paralectotype has an extremely large callus which reaches the suture. The forms *oblonga* Marrat and *granosocostata* Schepman have smaller than average callus-shields and the type of *N.deshayesii* Rousseau is intermediate between the *livescens* and *quadrata* form. It appears to be a trait in this species that the posterior margin of the callus-shield above the parietal wall is usually concavely indented.

N.livescens has been reported from the Red Sea by Sturany (1903) and by Bisacchi (1930), and from the Persian Gulf by Melvill & Standen (1901), but no specimens have been seen by me from these regions.

Nassarius (Niotha) nodifer (Powys, 1835)
(Plate 10,fig.13; Plate 11,figs.1-3)

1835. *Nassa nodifera* Powys, Proc.Zool.Soc.Lond. p.95; 1853 Reeve, Conch. Icon. 8:pl.4,fig.23; 1874 Tapparone-Canefri, Mem.R.Accad.Sci.Torino, (2), 28:120; 1919 K.Martin, Paleozool.Kennt.Java, p.84; 1931 van der Vlerk, Leid.geol.Meded. 5:234; 1931 King & Ping, Hongkong Naturalist 2(1):10, fig.1; 1934 Mari, J.Conchyl. 78:42; 1955 Marche-Marchad, J.Conchyl. 95:32.
1852. *Nassa stolida* A.Adams, Proc.Zool.Soc.Lond. Pt.19:105; 1853 Reeve,Conch.Icon. 8:pl.5,fig.31; 1859 Chenu, Man.Conchyl. 1:163,fig.770; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43.
1874. *Nassa (Telasco) stoliczkana* G. & H.Nevill, J.Asiat.Soc.Bengal, N.S., 43(2):25, pl.1,figs.8,8a.
1895. *Nassa (Uzita) nodifera* Powis, K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S., 1:115, pl.17,figs.235,235a.
1898. *Nassa (Alectrion) nodifera* Powis, Melvill & Sykes, Proc.Malac.Soc.Lond. 3:38.
1901. *Nassa (Alectryon) nodifera* Powys, Melvill & Standen, Proc.Zool.Soc.Lond. 2:411; 1911 Schepman, Siboga-Exped.49d:315; 1915 Tesch in Wanner, Palaentologie v.Timor 5:57, pl.81,figs.125a,b.
1939. *Nassarius (Zeuxis) hepaticus* (Montagu) Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):183 (non *Buccinum hepaticum* Montagu, 1803 = *Nassarius reticulatus* Linnaeus, 1758).
1942. *Alectrion hepaticus* (Montagu), Yen, Proc.Malac.Soc.Lond. 24:232.
1972. *Nassarius (Niotha) nodiferus* (Powys), Cernohorsky, Rec.Auckland Inst. 9:153, figs.69,70.

Shell up to 33.0 mm in length, elongate-ovate to almost ovate, solid, teleoconch of 6-7 weakly convex whorls, protoconch of 2½-3 glassy embryonic whorls which occasionally carry an extremely fine carina, sutures narrowly tabulate or weakly canaliculate; sculptured with strong, coarse axial ribs which become frequently arcuate on body whorls; spiral sculpture absent except for a subsutural groove which separates sutural nodules from axial ribs and 4-5 basal cords and 6-7 striae on the siphonal fasciole. Aperture moderately open, outer lip thickened and denticulate-lirate, edge of outer lip occasionally with small spinose denticles, columellar callus moderately narrow or partly spreading on to body whorl and frequently thinning above parietal wall, columella with up to 9 small denticles, siphonal and anal canals distinct. Greenish-grey or greyish-brown in colour, occasionally darker between ribs and sometimes with a few small dark brown spots on sutural nodules, body whorl with a pale, narrow central band, interior of aperture purplish-brown, columellar callus white or cream. Operculum brown and serrate at margins.

TYPE LOCALITY. Gallapagos Is and Panama = error! *(nodifer)*; none *(stolida)*; Calicut, India *(stoliczkana)*. Singapore, Malaysia, is here designated as the type locality (specimens in AMS and ZMC).

DISTRIBUTION. From India to Indonesia and Japan. In silt and sand, from the intertidal zone to a depth of 27 m.

Type specimens. Three syntypes of *N.nodifer* (Powys) are in the British Museum (N.H.), London No.197367, and the specimen measuring length 31.4 mm, width 19.0 mm, is here selected as the lectotype (pl.10,fig.13). The holotype of *Nassa stolida* (A.Adams, which is a pathological example of *Nassarius nodifer*, is in the same Institution No.1973137 length 31.3 mm, width 19.7 mm. The juvenile holotype of *Nassa stoliczkana* G. & H.Nevill, is in the Zoological Survey of India, Calcutta, length 10.2 mm, width 6.0 mm.

Material examined. MAURITIUS: (ZMC); INDIA: Bombay (ZSI); Bandra, N. of Bombay; Vengurla, N. of goa; Back Bay, Bombay (all USNM); off Chinde (Natal Mus.); SRI LANKA: (LACM); THAILAND: Koh Mok, 9-11 m; Terutao I, W.coast; Koh Chang; Koh Rin, 27 m (all ZMC); Koh Chang I, Ranong, Laem Pan Wa (both PMBC); MALAYSIA: Singapore (AMS; ZMC); Palau Tekukor, St.John's I; Sekundu I, Johore Str. (both USNM);

Tanjong Rhu, Kedah (coll.Richardson); S. of Pulau Langkawi, Kedah (coll.McCausland); INDONESIA: Horizon hotel Beach, Jakarta; Balikpapan, E.Kalimantan, Borneo: Kupang, W.Timor (all.coll.McCausland); Taka Bako, Macassar, 25 m (ZMC); CHINA: Hongkong (BMNH; ZMC); Tai Tan Harbour, Hongkong I; Tolo Harbour, New Territories; Lantao I, Shiu Han Prov. (all Auckland Univ.); Nan-Ta-Wu (USNM); Fukien Province (SDMNH); Stanley Beach, S.end of Hongkong I, 2 m (coll.Orr); TAIWAN: (coll.Gardner); JAPAN: Osima, Osumi (LACM); Oshima (AMS).

Fossil record. PLIOCENE: Kampong Tjikeusik, Tjibalinung, Java, Indonesia (K.Martin 1895); Noie Noni, Mollo, Timor, Indonesia (Tesch in Wanner 1915).

Nassarius (Niotha) venustus (Dunker, 1847)
(Plate 11 figs.4, 5)

1847. *Buccinum venustum* Dunker, Zeit.f.Malakozool. 4:59; 1849 Philippi, Abb. Beschr.Conchyl. 3:63, pl.2,fig.1.
1853. *Nassa venusta* (Dùnker), Reeve, Conch.Icon. 8:pl.7,figs.44a,b; 1934 Mari, J.Conchyl. 78:25.
1898. *Nassa (Niotha) venusta* (Dunker), Melvill & Sykes, Proc.Malac.Soc.Lond. 3:39.
1966. *Niotha venusta* (Dunker), Habe & Kosuge, Shells world col. 2:61, pl.22, figs.25,26.
1978. *Nassarius (Niotha) venustus* (Dunker), Cernohorsky, Trop.Pacific mar. shells p.82, pl.25,fig.4.
1982. *Nassarius venustus* (Dunker), Kaicher, Card cat.world-wide shells, Pack No.31:card 3235.

Shell up to 23.0 mm in length, elongate-ovate, solid, teleoconch of 6-7 weakly convex whorls protoconch of 2½ glassy embryonic whorls; sculptured with slender axial riblets which are constricted anterior to sutures by a shallow trough which separates sutural nodules; spiral sculpture distinctive and consisting of numerous, up to 35 on body whorl, crisp, crowded, overriding spiral threads, interspaces with numerous macroscopic axial striae. Aperture moderately narrow, outer lip thickened and with denticles on the edge, columellar callus spreading and almost reaching body whorl suture, callus always thinning above parietal wall with axial ribs protruding under the glaze, base of columella with a few denticles, siphonal and anal canals prominent. Bluish-grey or greenish in colour, banded with a paler colour, some specimens yellowish and banded with dark brown, interspaces of sutural nodules on body whorl with dark brown spots, interior of aperture dark greenish-brown and a pale narrow band, columellar callus creamy-white to orange in colour. Operculum brown, simple on margins or with 1-2 weak denticles on either side.

TYPE LOCALITY. Bali I, Indonesia.

DISTRIBUTION. From the Andaman Is to the Philippines and the New Hebrides. In sand patches and rock pools, intertidal.

Type specimens. The holotype of *N. venustus* (Dunker), is in the Zoological Museum, Humboldt University, Berlin, length 17.7 mm, width 10.6 mm.

Material examined. ANDAMAN IS: (AMS; USNM); INDONESIA: Gomomo I, Pitt Pass, Celebes; Morotai, Halmahera (both USNM); Bali (AMS); Kupang, W.Timor; Sanur Beach, Bali; Pantai Pura, N.of Kupang, W.Timor; Daeo, S. coast of Morotai, Malaka, Kalahabi Harbour, N.of Timor, Alor I; Pantai Kelapa Lima, 5 km W. of Kupang, W.Timor (all.coll.McCausland); Madjene, W.coast of Celebes (coll.van der Riet); PHILIPPINES: Batangas Bay, Luzon (coll.Ricks); San Juan, Tayabas Bay, Batangas (AMS); Tilig, Lubang I; Tagbayag, Palawan group; Nosugbu, Luzon; Misamis Pt., Mindanao; Guijulugan, Negros; Little Santa Cruz I, off Zamboanga (all USNM); PAPUA NEW GUINEA: Rabarua, E.New Britain (coll.Parkinson); Madang (coll.Hoeter); SOLOMON IS: Haroro, Guadalcanal (Auckland Univ.); NEW HEBRIDES: Tutuba I, Espiritu Santo I (coll.Coles).

Nassarius (Niotha) deshayesianus (Issel, 1866)
(Plate 11, figs.6-10)

1866. *Nassa deshayesiana* Issel, Mem.R.Accad.Sci.Torino (2), 23:393, pl.1, figs.1,2.
1888. *Phrontis obockensis* Jousseaume, Mem.Soc.Zool.France 1:184; 1944 Fischer & Beigbeder, Bull.Mus.Nat.d'Hist.Nat.Paris (2), 16:326.
1894. *Nassa zailensis* Sowerby, Proc.Malac.Soc.Lond. 1:160, pl.12,fig.25.
1898. *Nassa zailensis* var. *andamanica* Melvill & Sykes, Proc.Malac.Soc.Lond. 3:221, textfig.4.
1901. *Nassa (Arcularia) obockensis* Jouss., Melvill & Standen, Proc.Zool.Soc.Lond. 2:409.
1903. *Nassa (Phrontis) obockensis* (Jousseaume), Sturany, Denk.k.Akad.Wiss.math.-nat.Wien 74:243.
1930. *Nassarius (Phrontis) deshayesianus* (Issel), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genoa 55:52.
1932. *Nassa (Phrontis) obockensis* Jouss., Dautzenberg, J.Conchyl. 76:33.

Shell up to 20.0 mm in length, elongate-ovate, solid, teleoconch of 6-7 concavo-convex whorls, protoconch unknown; sculptured with angulate and frequently coarse axial ribs which are rendered nodulose by primary spiral cords which sometimes become obsolete in interspaces; additional numerous macroscopic spiral hair-lines are also present. Whorls constricted anteriorly by a moderately wide trough which clearly separates sutural nodules from remaining sculpture. Aperture moderately narrow, outer lip thickened and with 4-9 denticles on edge, columellar callus expanding and almost reaching body whorl suture but thinning above parietal wall where axial ribs are protruding under the glaze,

lower half of columella with strong folds or denticles. Cream to pale grey in colour, rare individuals uniformly orange, body whorl with a moderately broad greenish-brown central band and sometimes dark brown spots between sutural nodules, columellar callus white to cream, outer lip with 2-3 chocolate-brown spots in immature specimens. Operculum brown, margins simple.

TYPE LOCALITY. Ormus I, Persian Gulf *(deshayesianus)*; Obock, French coast of Somalia, E.Africa *(obockensis)*, Bay of Zaila [= Zeila], Somali Republic *(zailensis)*; Andaman Is *(andamanica)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf to Madagascar and the Andaman Is. In sand, intertidal.

Type specimens. The holotype of *N.deshayesianus* (Issel), is in the Museo Civico di Storia Naturale, Genova, length 18.0 mm, width 9.5 mm. The holotype of *Phrontis obockensis* Jousseaume, is in the Museum National d'Histoire Naturelle, Paris, length 11.0 mm. The holotype of *Nassa zailensis* Sowerby, is in the British Museum (N.H.), London, No.1895.4.29.182., length 14.8 mm, width 8.8 mm, and the type of *andamanica* Melvill & Sykes, has not been located.

Material examined. RED SEA: Aden (USNM); PERSIAN GULF: As Shaam, Ras al Khaimah, Trucial States (coll.Smythe); off Namakdan, 26°35'N & 55°29'E (ZMC); GULF OF OMAN: Muscat (Natal Mus.); Stragag camp, *c*.35 km W. of Muscat (coll.Luther); Qurram, 16 km W. of Muscat (coll.Luther); EAST AFRICA: Mozambique; Niali, Kenya (both USNM); MADAGASCAR: Plage Batterie, Tulear (SMOM); INDIA: Bombay (coll.Rickett); ANDAMAN IS: (ZSI).

Nassarius (Niotha) acuticostus (Montrouzier in Souverbie & Montrouzier, 1864)
(Plate 11, figs.11,12)

1833. *Buccinum pauperatum* Quoy & Gaimard, Voy.l'Astrolabe 2:439, pl.32, figs.5-7 (non Lamarck, 1822).
1864. *Nassa acuticosta* Montrouzier in Souverbie & Montrouzier, J.Conchyl. 12:273, pl.10,fig.8.
1877. *Nassa bullata* Marrat, Prop.new forms genus *Nassa* p.5 (nom.subst. pro *Buccinum pauperatum* Quoy & Gaimard, 1833).
1972. *Nassarius (Niotha) acuticostus (pars)* (Montrouzier), Cernohorsky, Rec.Auckland Inst.Mus. 9:151, fig.52 on left only.

Shell up to 19.0 mm in length, elongate-ovate, solid, shining, teleoconch of 5½-6 whorls, protoconch of 2+ embryonic whorls; sculptured with very slender axial ribs which are usually interrupted anterior to sutures by a shallow trough which also separates sutural nodules; spiral sculpture absent with the exception of numerous, very fine macro-striae on upper spire whorls. Aperture narrow, outer lip prominently thickened and swept up in profile, edge of outer lip denticulate, columellar callus partly spread on to body whorl, thick and concavely excavated above parietal wall, callus continuing as a lozenge-shaped extension above anal canal, columella with small denticles, siphonal and anal canals prominent, siphonal fasciole with a single strong cord. Cream to fawn in colour, body whorl with 1-2 greenish-brown spiral bands, columellar callus white, interior of aperture purple-brown, banded with white. Operculum brown and simple at margins.

TYPE LOCALITY. Art I, New Caledonia *(acuticostus)*; Tonga-Tabu, Tonga Is *(pauperatum* Quoy & Gaimard); New Guinea *(bullata)*.

DISTRIBUTION. From Indonesia to the Ryukyu Is and Niue I. In coral sand, sand-pockets on reefs, intertidal.

Type specimens. The type of *N.acuticostus* (Montrouzier), is in the Museum of Bordeaux, France, but it is not available for examination. The original description and illustration, however, clearly identify the species (pl.11,fig.11). The type of *Buccinum pauperatum* Quoy & Gaimard (also type of *bullata* Marrat) is in the Museum National d'Histoire Naturelle, Paris.

Material examined. INDONESIA: Daeo, S.coast of Morotai, Malaka; Pantai Kepala Lima, 5 km N. of Kupang, W.Timor; Pantai Pura, N. of Kupang, W.Timor; Nusa Tenggara, Timor (all coll.McCausland); PHILIPPINES: Tubajon Bay, Dinagat (ZMC); RYUKYU IS: Oshima I (coll.Powell); WEST IRIAN: Biak, Middleburgh I (both AMS); PAPUA NEW GUINEA: Nissan I (coll.Powell); Palikan village, Mussan I, New Ireland (coll.Parkinson); Laing I, Hansa Bay (coll.Tursch); Okaibolma village, Kiriwina I, Trobriand group; N. of Madang (both AMS); Mangop, S.of Kavieng, New Ireland (coll.Ritter); Madang (coll.Hoeter); AUSTRALIA: Lindeman I, Whitsunday Passage (AMS); SOLOMON IS: Rennell I, Karggava Bay (ZMC); Kumbara; Ata; Laulasi I, Malaita I; Wagina I, Choiseul I; Vanikoro, Santa Cruz group (all AMS); Maraunibina I, Marau Sound; Gaskell, Guadalcanal (both Auckland Univ.); NEW HEBRIDES: Kakula I, Undine Bay, N.Efate I (AIM); Tuki Tuki Pt.; Pango Pt.; Port Havannah, all Efate I (all coll.Eker); Lolowai, Aoba (coll.Gardner); LOYALTY IS: Lifu I (USNM); NEW CALEDONIA: (ZMC); FIJI IS: Ogea I, Lau group (coll.Northgrove); Savusavu Pt.; Leleuvia I, E.off Viti Levu (both coll.Dickerson); Korolevu, S.Viti Levu; Nadi Bay, W.Viti Levu (both AMS); Rat Tail Passage, Suva reef; Lomalagi, S.Viti Levu (both coll.WOC); NIUE I: (coll.Powell).

The Academy of Natural Sciences of Philadelphia, has a specimen labelled as the type of *"Nassa bilobata* Carpenter". The description has remained unpublished and the epithet is a nude manuscript name.

The concavely excavated posterior margin of the columellar callus and the build up callosity above the anal canal are constant specific characters in mature individuals of this species.

Nassarius (Niotha) semisulcatus (Rousseau, 1854)
(Plate 12, figs.1, 2)

1849. *Buccinum crassum* Koch in Philippi, Abb.Beschr.Conchyl. 3:43, pl.1,fig.4 (non Gmelin, 1791; nec Nyst, 1844).
1853. *Nassa crassa* Philippi, Reeve, Conch.Iconica 8:pl.7,figs.46a,b and pl.10,fig.67; 1908 Hirase, Conch.Mag.Kyoto 2:pl.29,figs.87-89.
1854. *Nassa semisulcata* Rousseau, Yoy.Pole Sud, Zool. 5:81, pl.21,figs.30,32.
1916. *Arcularia crassa* Philippi, Hedley, J.R.Soc.W.Australia 1:61.
1934. *Nassa percrassa* Mari, J.Conchyl. 78:24 (nom.subst.pro *N.crassa* Reeve, 1853, pl.10,fig.67 and Tryon, 1882, pl.13,fig.189).
1936. *Nassarius crassus* (Phil.), Hirase, Coll.Jap.shells ed.5:76, pl.106,fig.13; 1942 Yen, Proc.Malac.Soc.Lond. 24:231.
1961. *Phrontis crassus* (Phil.), Habe, Col.illust.shells Japan 2:64, pl.32,fig.11.
1972. *Nassarius (Niotha) acuticostus (pars)*, (Montrouzier in Souverbie and Montrouzier), Cernohorsky, Rec.Auckland Inst.Mus. 9:151, figs.51 and 52 on right (non *Nassa acuticosta* Montrouzier, 1864).
1978. *Nassarius (Niotha) semisulcatus* (Rousseau), Cernohorsky, Trop.Pacific mar.shells p.82, pl.25,fig.5.
1982. *Nassarius semisulcatus* (Rousseau), Kaicher, Card cat.world-wide shells, Pack No.31: card 3219.

The species is closely similar to *N.acuticostus* (Montrouzier) and differs from that species in the following features: It is more solid and rotund, less shining and is covered with a semi-translucent periostracum. The sculpture is granulose on the body whorl, particularly on the dorsal side where nodules are usually spirally aligned; the fine slender axial riblets of *N.acuticostus* are replaced by coarse and uneven ribs. The columellar callus is narrower in *N.semisulcatus*, particularly anteriorly, and evenly convex, lacking the concave depression above the parietal wall and the columella is regularly lirate along its entire length. The base colour is cream to greenish-fawn and the lower two-thirds of the body whorl are darker greenish-brown and frequently bordered posteriorly by a narrow dark brown interrupted line. Operculum brown, simple at margins.

TYPE LOCALITY. China *(crassum* and *percrassa)*; Solomon Is *(semisulcatus)*.

DISTRIBUTION. From Indonesia to Japan and the Samoa Is. In tide pools and lagoons, in coarse coral, muddy and weedy sand, intertidal.

Type specimens. The holotype of *N.semisulcatus* (Rousseau), is in the Museum National d'Histoire Naturelle, Paris, length 17.2 mm, width 12.3 mm. The type of *Buccinum crassum* Koch in Philippi, is no longer extant, and the type of *Nassa percrassa* Mari, is in the British Museum (N.H.), London.

Material examined. INDONESIA: W.coast of Nuhu Tjut, Kai Is (WAM); Batu Capea, E. of Ambon, Pulau Ambon; Pantai Kelapa Lima, 5 km N. of Kupang, W.Timor (both coll.McCausland); PHILIPPINES: off Basilan, Lay Lay, Marinduque; Tagbayag, Palawan group; Nasugbu, Luzon; Puerto Galera, Mindoro; Mactan I; Tawi Tawi group (all USNM); Luzon (AMS); CHINA: (BMNH; ZMC); TAIWAN: (USNM); RYUKYU IS: Oshima I (coll.Powell); Bolo Pt. and Seragaki area, both Okinawa (both coll.Deynzer); Nago, Okinawa (USNM); JAPAN: Kii (LACM); CAROLINE IS: Ulang, Palau Is (USNM); PAPUA NEW GUINEA: Rabaul, New Britain (coll.Prior); Port Moresby (AMS); China Str. (coll.Powell); AUSTRALIA: Port Hedland, W.Australia (coll.Powell); SOLOMON IS: off Yacht club, Honiara, Guadalcanal (coll.Whitehead); Jetty reef, Guadalcanal (Auckland Univ.); Honiara (coll.Dillworth); Reef I, Santa Cruz group (AMS); NEW HEBRIDES: Tutuba I, Espiritu Santo (coll.Coles); Point Arbel, Vila (NMNZ); Kakula I, Undine Bay, Efate I (coll.WOC); Port Vila, Efate I (AMS); Lolowai, Aoba I (coll.Gardner); LOYALTY IS: Lifu I (coll.Powell); NEW CALEDONIA: Noumea (AMS); FIJI IS: Lakeba and Moce I, both Lau group (AIM); Suva reef, S.Viti Levu (coll.Eker); 6 km E.of Sigatoka, S. Viti Levu (coll.Marrow); Vatua village, Korolevu; Bulia I, Gt.Astrolabe reef; E. of Bau I, S.Viti Levu (all ZMC); Wakaya I near Ovalau I (AIM); Ogea I, Lau group (coll.Northgrove); Savusavu Point (coll.Dickerson); Nadi Bay, W.Viti Levu; Korolevu, S.Viti Levu; Lami, S.Viti Levu (all AMS); TONGA IS: Nuku'alofa (coll.Powell); Va'vau (coll.Northgrove); SAMOA IS: Watson's I, Apia (AIM); Savaii (coll.Powell).

The species does not appear to live in the Western Indian Ocean, but the closely related species *N.natalensis* (E.A.Smith) lives in S.E. Africa.

Nassarius (Niotha) natalensis (E.A.Smith, 1903)
(Plate 12, figs.3,4)

1853. *Nassa sturmii* Reeve, Conch.Icon. 8:pl.22, figs.148a,b (non *Buccinum sturmii* Philippi, 1849 = *Nassarius*).
1903. *Nassa natalensis* E.A.Smith, Proc.Malac.Soc.Lond. 5:373, pl.15,fig.6; 1959 Barnard, Ann.Sth.Afric.Mus. 45:112; 1973 Kensley, Sea-shells Sth.Africa p.162, fig.601.
1928. *Nassarius natalensis* (Smith), Tomlin, Ann.Sth.Afric.Mus. 25:322; 1936 Peile, Proc.Malac.Soc.Lond. 22:140 (description of radula).

Shell up to 22.0 mm in length, elongate-ovate, solid, teleoconch of 5½-6 whorls, protoconch unknown; whorls distinctly concave anterior to sutures; sculptured with slender and often angulate axial ribs, ribs nodulose on presutural ramp of spire whorls, axial ribs becoming weaker on body whorl but more distinctly nodulose. Aperture moderately narrow, outer lip thickened and variced, denticulate-lirate within, columellar callus spreading partly on to body whorl, columella with a few denticles, siphonal and anal canals distinct. Cream, grey or greenish-brown in colour, ornamented with an interrupted dark brown spiral line adjacent to sutures on spire whorls and one in centre of body whorl, some specimens darker brown and banded with white, lower half of body whorl darker in some specimens, columellar callus white.

TYPE LOCALITY. Natal, South Africa *(natalensis)*; West Indies = error! (*sturmii* Reeve).

DISTRIBUTION. From Natal, South Africa to Zanzibar, East Africa. In silt, among rocks, intertidal.

Type specimens. The holotype of *N.natalensis* (E.A.Smith), is in the British Museum (N.H.), London, No.1899.4.14.493-4., length 21.4 mm, width 12.4 mm. Three specimens of *"Nassa sturmii"* Reeve, are in the same Institution.

Material examined. SOUTH AFRICA: Chakas Rock, Umhlali, Natal; Bluff, Durban, Natal (both Natal Mus.); EAST AFRICA: Nacala Bay, E.Fernando Veloso, Mozambique; S.W.Mozambique I, Mozambique (both Natal Mus.); 8 km N of Chwaka, E.Zanzibar (AIM); Porto Amelia, Mozambique (coll. Grosch).

Nassarius (Niotha) distortus (A.Adams, 1852)
(Plate 12, figs.5-8)

1833. *Buccinum coronatum* var. or new species Quoy & Gaimard, Voy.l'Astrolabe, Zool. 2:440, pl.32,figs.11,12 (non Bruguière, 1789).
1834. *Buccinum monile* Kiener, Spéc.gen.icon.coq.viv. 9:68, pl.11,fig.40 (non Linnaeus, 1771).
1852. *Nassa distorta* A.Adams, Proc. Zool.Soc.Lond. Pt.19:105; 1853 Reeve, Conch.Icon. 8:pl.5,figs.32a,b; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:42.
1853. *Nassa monile* Kiener, Reeve, Conch.Icon. 8:pl.6,fig.38; 1879 E.A.Smith, Proc.Zool.Soc.Lond. p.808; 1917 Odhner, Kung.Svenska Vet.Handl. 52:11; 1922 Hornell, Madras Fish.Bull. 14:214; 1934 Mari, J.Conchyl. 78:24.
1853. *Nassa lachrymosa* Reeve, Conch.Icon. 8:pl.8,fig.52; 1877 Brazier, Proc.Linn.Soc.N.S.W. 1:178; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:96; 1934 Mari, J.Conchyl. 78:24.
1886. *Nassa (Alectryon) monile* Kiener, Watson, Rept.Sci.Res.Voy.H.M.S. "Challenger", Zool. 15:180; 1898 Melvill & Standen, J.Conch. 9:41; 1929 Dautzenberg, Faun.Colon.Franc. 3:409.
1895. *Nassa (Alectryon) monilis* Kiener, Melvill & Standen, J.Conch. 8:107; 1911 Schepman, Siboga-Exped. 49d:315.
1897. *Nassa (Alectrion) monilis* Kiener, Melvill & Sykes, Proc.Zool.Soc.Lond. 2:169.
1957. *Nassarius monile* Kiener, Kaicher, Indo-Pacific Sea shells pl.7,fig.21.
1972. *Nassarius (Niotha) distortus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:152, fig.62 (radula), fig.67 (shell); 1972 Cernohorsky, Mar.shells Pacific 2:148, pl.44,fig.5.
1982. *Nassarius distortus* (A.Adams), Kaicher, Card cat.world-wide shells, Pack No.31: card 3162.

Shell up to 30.0 mm in length, elongate-ovate, some specimens broader than others, teleoconch of 6-7 convex whorls, protoconch of 2½-2¾ glassy, finely carinate purple embryonic whorls; sculptured with slender and frequently arcuate axial ribs which are separated from the sutural nodules by a shallow concave trough, ribs subangulate on presutural ramp and sometimes becoming obsolete or low and irregular on body whorl; interspaces completely smooth and a few coarse spiral cords develop only towards the base. Aperture moderately narrow, outer lip variced and denticulate-lirate within, columellar callus thick and spreading in a circular sweep on to body whorl, base of columella with up to 7 denticles, siphonal and anal canals distinct. White to cream in colour, banded with green or greenish-brown, bands usually confined to interspaces of axial ribs, columellar callus white to cream, aperture banded with purple-brown. Operculum brown and either serrate or simple at margins.

TYPE LOCALITY. None *(distortus* and *lachrymosa)*; Purbeck and Weymouth, England [= error!] and coast of New Guinea (*monile* Kiener). Cebu I, Philippines, is here designated as the type locality (specimens in AMS and AIM).

DISTRIBUTION. From the Andaman Is to Taiwan and the Cook Is. In clean, muddy and weedy coral sand, in lagoons, from the intertidal zone to a depth of 19 m.

Type specimens. Three syntypes of *N.distortus* (A.Adams) are in the British Museum (N.H.), London, No.197334, and the specimen measuring length 23.5 mm, width 12.8 mm, is here selected as the lectotype (pl.12,fig.6). The holotype of *Nassa lachrymosa* Reeve, is in the same Institution, No.197343, length 26.4 mm, width 12.6 mm.

Material examined. ANDAMAN IS: (ZSI); NICOBAR IS: Nancowry (ZMC); MALAYSIA: Sambelong (ZMC); INDONESIA: Saparoea Bay, S.of Ceram I, 19 m (ZMC); Pulau Bai, Batu group, off Sumatra; Pulau Siburu, S.W. of Sumatra; Keledjitan, Bantam, Java (all USNM); Kupang, W.Timor; Pantai Pura, N.of Kupang, W.Timor (both coll.McCausland); PHILIPPINES: Hundred Is, Lucap; Cebu (both coll.Powell); Cebu I (AIM, AMS); near Cebu City, Cebu; Maricaban I, Luzon; Balayan Bay, Luzon (all USNM); Matabungkong, *c.*115 km S.S.W. of Manila (AMS); Punta Engano, Mactan I, Cebu (coll.Dan); TAIWAN: (coll.Allo); CAROLINE IS: Peleliu, Palau Is (USNM);N.E. Ponape lagoon, (coll.McCausland); WEST IRIAN: Middleburgh I; Soepiori, Schouten Is (both AMS); PAPUA NEW GUINEA: near Gamododo, Milne Bay (USNM); Port Moresby (AMS); AUSTRALIA: Kapok Cove, Lizard I, Queensland (AMS); SOLOMON IS: Lavanggu, Rennell I (ZMC); Matui I, Marovo lagoon, New Georgia; Marau Sound, Guadalcanal; Maraunibina I, Guadalcanal (all Auckland Univ.); Pavuvu I, Russell Str. (USNM); Kumbara; off Sunday reef, Vanikoro, Santa Cruz group (both AMS); NEW HEBRIDES: Pango Pt., and Meli I, both Efate I (both AIM); Port Havannah and Malapoa Pt., both Efate I (both coll.Eker); Tutuba I, Espiritu Santo; Undine Bay, Efate I; Pango Beach, Efate I (all coll.Coles); Erakor reef, Efate I (coll.Bratcher); Erromanga (AMS); Tanna I (coll.Delambre); LOYALTY IS: Lifu I (AIM; USNM); Shepenehe, Lifu I (ZMC); NEW CALEDONIA: Anse Vata, Noumea (AIM); Bayes Pt., N.E.coast of New Caledonia (coll.Taylor); Poindimie; Ile St.Marie; Bourail (all AMS); FIJI IS: Vatua village near Korolevu; 15km E. of Bau I, S.Viti Levu; S.of Cave I, Suva Bay, 18°07'S & 178°23'E (all ZMC); Suva reef, Sth.Viti Levu; Manava I, N.off Viti Levu (both coll.Eker); W.of Rat Tail Passage, Suva reef; Malolo I, Mamanuca group (both coll.Marrow); Ogea I, Lau group (coll.Wade); Levuka, Ovalau I (USNM); Nadi Bay, W.Viti Levu; Korolevu, S.Viti Levu; Ono I (all AMS); Lami, S.Viti Levu (coll.McCausland); Lakeba I; Moce I and Karoni I, all Lau group (AIM); N.end of Vanua Balavu (coll.Dickerson); SAMOA IS: Apia Harbour; Vaoto, Vailele Bay, Upolu I (AIM); Pago Pago (AMS; USNM); Tutuila (USNM); Sogi, Apia (coll.Scott); COOK IS: Rarotonga (AIM).

The species has long been known as *Nassarius monilis* (Kiener, 1834) which is a primary homonym of *Buccinum monile* Linnaeus, 1771. Specimens from Indonesia and the Philippines usually have a much smoother appearance, with less prominent axial ribs on body whorl, than specimens from the Western Pacific.

Nassarius (Niotha) stolatus (Gmelin, 1791)
(Plate 12, figs.9-12)

1780. *"Nassa fasciata"* Chemnitz, Syst.Conchyl.Cab. 4:43, pl.124,figs.1167-1169 (non binomial).
1791. *Buccinum stolatum* Gmelin, Syst.Naturae ed.13:3496 (ref. to Chemnitz, *op.cit.*, figs.1167-1169); 1825 Wood, Index Testac. p.112, pl.23,fig.120.
1798. *Distorsio communis* Roeding, Mus.Bolten. p.133 (ref. Chemnitz, *op.cit.*, fig.1169).
1834. *Buccinum ornatum* Kiener, Spéc.gen.icon.coq.viv. 9:80, pl.21,fig.83 (non Say, 1822).
1852. *Nassa fasciata* Moerch, Cat.Conchyl.Yoldi 1:78 (ref.Chemnitz, *op.cit.*, fig.1167) [non *Buccinum fasciatum* Lamarck, 1822 = *Nassarius*].
1853. *Nassa ornata* (Kiener), Reeve, Conch.Icon. 8:pl.5,fig.33.
1887. *Nassa stolata* (Gmelin), v.Martens, J.Linn.Soc.Lond. 21:180; 1919 K.Martin, Paleozool.Kennt.Java p.84; 1923 Oostingh, Meded.Landbouw. 26(3):113, fig.14; 1928 K.Martin, Wet.Meded.Mijnb.Ned.-Indie No.10:9.
1895. *Nassa (Hima) stolata* (Gmelin), K.Martin, Samml.geol.Reichs.-Mus.Leiden, N.S., 1(2):116, pl.18,figs.262,262a; 1898 Melvill & Standen, J.Conch. 9:41; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:414; 1955 Marche-Marchad, J.Conchyl. 95:32.
1957. *Nassarius stolatus* (Gmelin), Kaicher, Indo-Pacific Sea shells pl.7,fig.15; 1982 Kaicher, Card cat.world-wide shells, Pack No.31: card 3227.

Shell up to 30.0 mm in length, elongate-ovate, moderately light in weight, teleoconch of 6-7¼ convex whorls,protoconch of 2-2¼ glassy, embryonic whorls; post-embryonic whorls sculptured with angulate axial ribs and 2-3 bisecting cords which form nodules upon ribs, last 3 whorls with strongly angulate axial ribs and 2-4 spiral cords anterior to suture, spiral sculpture usually obsolete on centre of body whorl but prominent again towards base, space between body whorl and siphonal fasciole with a broad channel. Aperture moderately wide, outer lip prominently variced and denticulate within, columellar callus moderately narrow and glazed above parietal wall, columella denticulate and descending almost vertically to the siphonal canal. Whitish or yellowish-cream in colour, banded with dark chocolate-brown, or dark chocolate-brown and banded with cream, rare individuals uniformly light yellow and lacking bands, aperture pale yellow. Operculum brown, serrate at margins.

TYPE LOCALITY. Tranquebar, India *(stolatus)*; Tranquebar, Coromandel and Ceylon *(ornatum)*.

DISTRIBUTION. From the Persian Gulf to Indonesia and Vietnam. In muddy sand, intertidal.

Type specimens. The type of *N.stolatus* (Gmelin) is no longer extant, and the type figures from Chemnitz (1780), pl.124, figs.1167,1168, are here designated as the illustrated lectotype (pl.12,fig.9). The type of *Buccinum ornatum* Kiener, has not been traced.

Material examined. INDIA: Yersova near Andheri, Salsette I, Bombay (Auckland Univ.); Madras; Chilka, Orissa (both ZSI); Bandra, N.of Bombay; Tuticorin; Marmagao, Goa; Back Bay, Bombay; Vasco da Gama, Goa (all USNM); Bombay (AMS; SDMNH); SRI LANKA: (AMS; LACM; SDMNH); THAILAND: off the west coast, 7°58'25"N & 98°52'04"E, *c.*2 m; Koh Kong (both ZMC); Lem Sing; Khan Nu Paknan, Gulf of Thailand (both USNM); MALAYSIA: Singapore (AMNS; SDMNH); Penang I (AMS); Batu Ferringhi, Penang (coll.McCausland); CAMBODIA: Kampot (SDMNH); INDONESIA: Cheribon, Java (ZMC); Horizon hotel Beach, Ancol, Jakarta (coll.McCausland); Java (USNM); Labuan, Sabah, Borneo; Tanjong Lobang, Sarawak, Borneo (both coll.Richardson).

Fossil record. PLIOCENE: Atjeh, Sumatra (K.Martin 1928); PLEISTOCENE: Grissee, Java (K.Martin 1895).

Nassarius (Niotha) jacksonianus (Quoy and Gaimard, 1833)
(Plate 13, figs.1-4)

1833. *Buccinum jacksonianum* Quoy & Gaimard, Voy.l'Astrolabe, Zool.2:452, pl.32,figs.28,29.
1852. *Buccinum polygonatum* A.Adams, Proc.Zool.Soc.Lond. Pt.19:94 (ref. to Quoy & Gaimard, pl.32, figs.28,29) [non Lamarck, 1822].
1875. *Nassa jacksoniana* Quoy & Gaimard, Langdon, Quart.J.Conch. 1:72; 1915 Hedley, Proc.Linn.Soc.N.S.W. 39:736; 1952 Satyamurti, Bull.Madras Govt.Mus. N.S., 1:182, pl.17,figs.3a,b.
1877. *Nassa harpularia* Marrat, Prop.new forms genus *Nassa*, p.8.
1904. *Nassa (Phrontis) siva* Preston, J.Malac. 11:76, pl.6,figs.3,4.
1928. *Nassarius (Alectrion) jacksonianus* Q. & G., Melvill, Proc.Malac.Soc.Lond. 18:106.
1972. *Nassarius (Niotha) jacksonianus* (Quoy & Gaimard), Cernohorsky, Rec.Auckland Inst.Mus. 9:151, fig.53.

Shell up to 18.0 mm in length, elongate-ovate and solid, teleoconch of 5½-6½ whorls, protoconch missing in all specimens examined, sutures adpressed; post-embryonic whorls sculptured with coarse, thick axial ribs which are encircled by 3-4 sharp spiral threads; on later whorls axial ribs appear to stop short of sutures, however, ribs may be continuous in some individuals. Axial ribs frequently become obsolete on the dorsal side of the body whorl, 2-4 spiral cords anterior to sutures on last 2 whorls usually more prominent, and in some individuals even slightly nodulose on the presutural ramp, spiral cords obsolete in centre of body whorl and becoming again more prominent towards the base. Aperture moderately narrow, outer lip thickened and with a strong, broad varix and 5-8 denticles within, columellar callus narrow, laminated basally and glazed above parietal wall, lower half of columella with small, strong denticles, parietal denticle distinct. Cream to bluish-grey in colour, spire whorls with a narrow brown band adjacent to suture, body whorl with a narrow and a broad brown band, some specimens brown and banded with creamy-white, aperture very light yellow, banded with brown in interior. Operculum brown and serrate at margins, but some individuals with only a single denticle on either side.

TYPE LOCALITY. Port Jackson, Australia [= error!] *(jacksonianus)*; none *(harpularia)*; Ceylon [= Sri Lanka] *(siva)*. Singapore, Malaysia, is here designated as the type locality of *N.jacksonianus* (specimens in AMS, NMV and ZMC).

DISTRIBUTION. From India to Indonesia. On mud-flats, intertidal.

Type specimens. The type of *N.jacksonianus* (Quoy & Gaimard) could not be found in the Museum National d'Histoire Naturelle, Paris (Dr.P.Bouchet, *in litt.*). Despite some nomenclatorial problems, the species has been well described and illustrated (pl.13,fig.1), and a neotype selection is considered unnecessary. Ten syntypes of *Nassa harpularia* Marrat, are in the Merseyside County Museum, Liverpool, and the specimen measuring length 12.0 mm, width 6.5 mm, is here selected as the lectotype (pl.13,fig.2). The holotype of *N.siva* Preston, is in the British Museum (N.H.), London, No.1905.2.8.10., length 12.8 mm, width 7.0 mm.

Material examined. INDIA: Calicut; Chilka (both ZSI); Bandra, N. of Bombay; Mangalore; Vingurla, N.of Goa; Madras; Bandon Bight (all USNM); Tuticorin; Bombay (both LACM); SRI LANKA: (NMV; USNM); THAILAND: Ko Phuket I; E.side Ko Phuket (both ZMC); Ao Nam Bor, Phuket (PMBC); Koh Pepidan (USNM); W.coast of Phuket I (coll.Orr); MALAYSIA: S.coast of Pulau Pekong, N.E. of Singapore I (ZMC); Siglap, Singapore (coll.Powell); Singapore (AMS; NMV; ZMC); Pulau Langkawi, Kedah (coll.McCausland); Mersing, Johore (coll.Richardson); INDONESIA: Java (LACM).

The species was erroneously described from Port Jackson, Australia and has subsequently been included in the Australian fauna. Langdon (1875) correctly reported the species from Ceylon, and Hedley (1915) saw unnamed specimens of *N.jacksonianus* from Bombay in the British Museum (N.H.). Quoy & Gaimard did not collect the species but were given a specimen by the Sydney botanist Fraser, and Hedley *(op.cit.)* correctly suspected that the species did not originate from Australian shores.

The form *harpularia* Marrat, has axial ribs which extend all the way to the sutures and the shell is usually brown, with a pale band. This form is not confined to Sri Lanka but also occurs sporadically in other populations.

Nassarius (Niotha) kruizingai Oostingh, 1939
(Fig. 111)

1939. *Nassarius (Hebra) kruizingai* Oostingh, Ing.Ned.-Indie Mijnb. & Geol. 6(12):167, pl.15, figs.257a,b; 258a,b; 259,260.

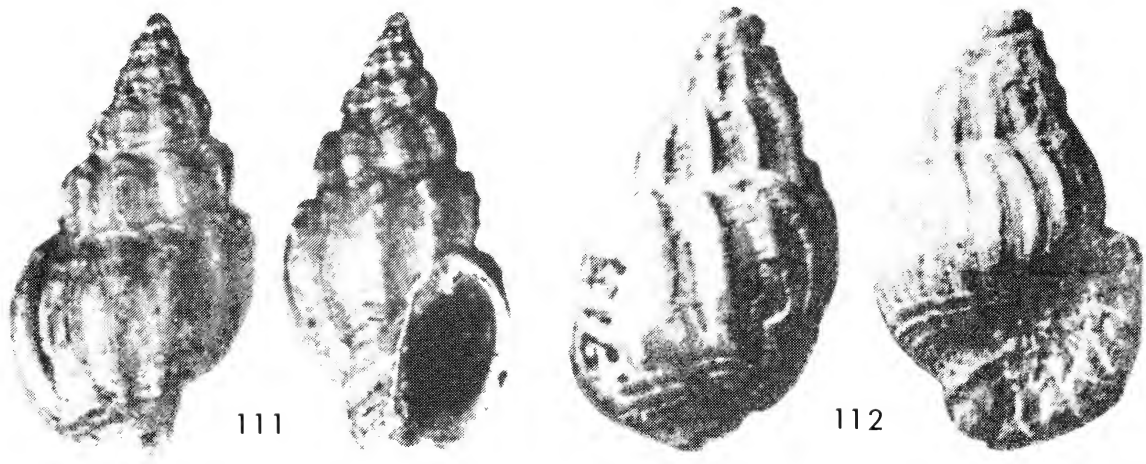
Shell *c.* 10.0 mm in length, more or less shining, teleoconch of 5 whorls, protoconch of 1½ smooth conical embryonic whorls. Post-embryonic whorls separated by a simple suture; the prominence of the spiral cords is variable, they may be distinct or may manifest themselves as nodules upon the axial ribs as in the holotype, and interspaces may be smooth; the body whorl has spiral cords anteriorly to the sutures, siphonal fasciole with a strong cord and *c.* 4 oblique cords. Outer lip moderately strongly variced, denticles weakly developed but in some individuals they are quite prominent, columella narrow and with a few wrinkles and denticles, parietal denticle prominent (condensed translation).

TYPE LOCALITY. St.763, Tjibatoerandjang, S.Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type of *N.kruizingai* Oostingh, is probably in the Museum of Bandoeng, Indonesia. The given dimensions were length 9.5 mm, width 5.0 mm.

This species closely resembles nodulose individuals of *N.jacksonianus* (Quoy & Gaimard), and the types, when located, should be compared with this species.



Figs. 111,112. Fossil Nassariinae. 111. *Nassarius (Niotha) kruizingai* Oostingh. Type-figure; 9.5 mm (from Oostingh, 1939, pl.15, figs.257a,b). 112. *N. (N.) persicus* Cox. Type-figure; 17.0 mm (from Cox, 1936, pl.8, figs.19a,b).

Nassarius (Niotha) festivus (Powys, 1835)
(Plate 13, figs. 5-9)

1835. *Nassa festiva* Powys, Proc.Zool.Soc.Lond. p.95; 1853 Reeve, Conch.Icon. 8:pl.18,fig.117; 1871 Lischke, Japan.Meeres-Conchyl. 2:53; 1874 Tapparone-Canefri, Mem.R.Accad.Sci.Torino (2), 28:122; 1882 Dunker, Ind.Moll.mar.Japonici p.37; 1908 Hirase,Conch.Mag.Kyoto, 2:177, pl.29,figs.92,94 (shell), fig.93 (radula).
1844. *Nassa nodata* Hinds, Zool.Voy.H.M.S."Sulphur" p.36, pl.9,figs.14,15; 1853 Reeve, Conch.Icon. 8:pl.7,fig.41.
1860. *Nassa lirata* Dunker, Malakozool.Blaetter 6:231; 1861 Dunker, Moll.Japonica p.7, pl.1,fig.22.
1870. *Tritia festiva* (Powis), A.Adams, Ann.Mag.Nat.Hist. (4), 5:426.
1879. *Nassa (Hima) festiva* Powys, E.A.Smith, Proc.Zool.Soc.Lond. p.211; 1895 Pilsbry, Cat.Mar.Moll.Japan p.35.

1901. *Nassa (Hebra) bonneti* Cossmann, Essai paleoc.comp. 4:209, pl.9,figs.18,19; 1903 Cossmann, J.Conchyl. 51:144, pl.5,figs.4,5.
1924. *Nassa (Hebra) bouneti (sic)* Cossman, Vredenburg, Rec.Geol.Surv.India 55:74.
1924. *Nassa (Hebra) bouneti (sic)* var. *kachhensis* Vredenburg, Rec.Geol.Surv.India 55:74 *(nomen nudum)*.
1925. *? Nassa (Hebra) bonneti* var. *kachhensis* Vredenburg, Mem.Geol.Surv.India 50:210, pl.7,fig.8.
1934. *Nassarius festivus* (Powys), Nomura & Zinbo, Venus:Jap.J.Malac. 4:305; 1936 Hirase, Coll.Jap.shells ed.5:76, pl.106,fig.10.
1954. *Tritia (Hinia) festivus* (Powys), Kira, Col. Illust.shells Japan 1:56, pl.28, fig.18; 1957 Amio, J.Shimonozeki Coll.Fisheries 6:274,fig.1 (egg-capsules & larvae).
1960. *Nassarius (Hinia) prefestivus* MacNeil, U.S.Geol.Surv.Prof.Pap. No.339: 81, pl.13,fig.31.
1961. *Nassarius (Hinia) festivus* (Powys), Hayasaka, Repts.Tohoku Univ.Sendai, (2), Geol., 33(1):85, pl.11,figs.2a,b.
1967. *Hinia festiva* (Powys), Habe & Kosuge, Stand.Book Jap.shells col. 3:76, pl.29.fig.33.
1971. *Reticunassa festiva* (Powys), Kuroda & Habe, Sea shells Sagami Bay, p.174, pl.48,figs.17,18.
1972. *Nassarius (Niotha) festivus* (Powys), Cernohorsky, Rec.Auckland Inst.Mus. 9:153, fig.68.

Shell up to 20.0 mm in length, elongate-ovate, solid, teleoconch of 5-6¼ convex whorls, protoconch of 2¼ smooth, glassy embryonic whorls; sculptured with coarsely nodulose axial ribs, nodules on axial ribs connected by flat and often obsolete spiral cords which become more prominent towards the base of the shell. Aperture moderately narrow, back of outer lip thickened and prominently varied and with strong denticles within, columellar callus spreading partly on to body whorl and usually thinning above parietal wall, columella with distinct lirae, siphonal and anal canals distinct. White to fawn in colour, some specimens banded with reddish-brown others lined with brown in interspaces of spiral cords, some individuals uniformly dark brown, columellar callus white, interior of aperture banded with dark chocolate-brown.

TYPE LOCALITY. Panama and St.Elena [= error!] *(festivus)*; Straits of Malacca, 31 m *(nodata)*; Decima, Japan *(lirata)*; Karikal, Pliocene of India *(bonneti)*; near Warsar, N.of Jakao, Gaj of Kachh, India, ? Miocene *(kachhensis)*; Chinen Sand, Okinawa, Pliocene of Ryukyu Is *(prefestivus)*. Nagasaki, Japan, is here designated as the type locality (specimens in USNM).

DISTRIBUTION. From India to Malaysia and Japan. In muddy sand, from the intertidal zone to a depth of 16 m.

Type specimens. Three syntypes of *N.festivus* (Powys) are in the British Museum (N.H.), London, No.197365, and the specimen measuring length 18.8 mm, width 10.0 mm, is here selected as the lectotype (pl.13, fig.5). A probable syntype of *Nassa nodata* Hinds, is in the same Institution, No. 1844.9.23.15., length 17.5 mm, width 9.8 mm. The type of *N.bonneti* Cossmann, is probably in the Ecole des Mines, Paris, that of *N.kachhensis* Vredenburg, in the Geological Survey of India collection, and the holotype of *Nassarius prefestivus* MacNeil, is in the National Museum of Natural History, Washington, No. USNM-562953, length 11.4 mm, width 6.6 mm.

Material examined. INDIA: Bombay (USNM); SRI LANKA: (LACM); MALAYSIA: Singapore (USNM); KOREA: (USNM); CHINA: Peitaho (ZMC); Peitaho, N.Chihli coast; Amoy; Hongkong (all USNM); Shui Han Bay, Lantow I and S.W. end of Cheung Chan I, both Hongkong (both AMS); Tai Tan Bay, Hongkong (coll.Marrow); JAPAN: Tokasago, Hyogoken; Tomioka, Tokyo Bay (both coll.Powell); Isa Ise (AIM); Oominato I; Awaji (both LACM); Hakodate; Akashi; Wakanura, Kishiu; Mogi; Yokohama; Funagawa; Hirado, Hizen; Nagasaki; Chiba Beach, 27 km N. of Tokyo; Tomioka, Kyushu (all USNM); Jigoashima; Tsu Micken (both SDMNH); Tosa; Ise Mie-ken Misaki; Sagami; Hondo I (all AMS); Misaki, Takasago, Hyogoku (both coll.Azuma).

Fossil record. PLIOCENE: Karikal, India (Cossmann 1903); Chinen Sand, Okinawa, Ryukyu Is (MacNeil 1960).

Nassarius (Niotha) coronulus (A.Adams, 1852)
(Plate 13, figs.10,11)

1851. *? Buccinum afrum* Philippi, Zeit.f.Malakozool. 8(4):56.
1852. *Nassa coronula* A.Adams, Proc.Zool.Soc.Lond. Pt.19:96; 1853 Reeve, Conch.Iconica 8:pl.15,figs.99a,b; 1885 Cooke, Ann.Mag.Nat.Hist. (5), 15:326; 1934 Mari, J.Conchyl. 78:12.
1869. *? Nassa afra* Philippi, Issel, Malac.mar.Rosso p.125.
1929. *Nassa (Phrontis) coronula* A.Adams, Dautzenberg, Faune Colon.Franc. 3:411.

Shell up to 17.0 mm in length, elongate-ovate and very solid, teleoconch of 5½-6½ weakly convex whorls, protoconch of 2½-2¾ glassy, finely carinate embryonic whorls; sculptured with rather thick, rounded axial ribs which number from 8-10 on the penultimate and the same number on the body whorl; spiral sculpture almost obsolete apart from some very fine spiral grooves in some individuals, siphonal fasciole with 6-7 spiral cords, macroscopic axial growth-striae present in some specimens. Aperture narrow, outer lip thick and broadly variced, posterior end prominently callouse and upswept in profile, interior denticulate-lirate, columellar callus thick and partly expanding

on to body whorl, lower half of columella denticulate. Steel-grey to greenish-brown in colour, banded with bluish-white, some ribs lighter in colour, some specimens with a few orange spiral lines, columellar callus white, interior of aperture purple-brown, banded with white. Operculum brown, and with only 1-3 small denticles at margin.

TYPE LOCALITY. Corregidor, Bay of Manila, Philippines [= error?] *(coronulus)*; East Africa; Aden; Madagascar *(afrum)*.

DISTRIBUTION. From the Red Sea to East Africa and Madagascar. From the intertidal zone to a depth of 10 m.

Type specimens. Four syntypes of *N.coronulus* (A.Adams), are in the British Museum (N.H.), London, No.197324, and the specimen measuring length 14.6 mm, width 9.0 mm, is here selected as the lectotype (pl.13,fig.10). The type specimen of *Buccinum afrum* Philippi, has not been traced.

Material examined. MADAGASCAR: (Zool.Mus.Humboldt Univ.,Berlin); Grand Recif, Tulear (SMOM).

It is quite probable that *N.afer* (Philippi) is an earlier name for *N.coronulus* (A.Adams). Philippi's types can no longer be found and the matter is complicated by the presence of 2 different species labelled *"Buccinum afrum* Philippi" from Madagascar, in the Dunker collection in the Zoological Museum, Humboldt University, Berlin. I found it advisable to retain the well-documented taxon *N.coronulus* (A.Adams) for this species.

Adams' type locality of "Philippines" is suspect. The species has been reported from the Red Sea by Cooke (1885), is known to live in Madagascar, but has not been recorded outside those regions since its description.

Nassarius (Niotha) crenoliratus (A.Adams, 1852)
(Plate 14, figs.1-3)

1852. *Nassa crenolirata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:100; 1853 Reeve, Conch.Icon. 8:pl.25, figs.165a,b.
1911. *Nassa (Phrontis) crenolirata* (A.Adams), Schepman, Siboga-Exped. 49d:322.
1972. *Nassarius (Niotha)* sp. Cernohorsky, Rec.Auckland Inst.Mus. 9:159, fig.72 (shell), fig.93 (radula).
1972. *Nassarius* sp. Cernohorsky, Marine shells Pacific 2:pl.43,fig.4.
1978. *Nassarius (Niotha) crenoliratus* (A.Adams), Cernohorsky, Trop.Pacific mar.shells p.82, pl.25,fig.3.

Shell up to 14.0 mm in length, elongate-ovate, solid and squat, teleoconch of 5¼-5¾ weakly convex whorls, protoconch of 3-3¼ glassy, finely carinate embryonic whorls; sculptured with broad, coarse, nodulose and frequently oblique axial ribs and a row of sutural nodules; spiral sculpture of rope-like spiral cords which become nodulose upon axial ribs, some individuals with 4-5 more elevated spiral cords and echinate nodules, siphonal fasciole broad and with 5-6 strong cords. Aperture narrow, outer lip thick and variced, denticulate-lirate within, columellar callus moderately narrow and partly extending on to body whorl, columella angular, lower half turned towards aperture and distinctly denticulate, siphonal and anal canals prominent. White to greenish-white in colour, ornamented with brown bands or spots in interspaces of sutural nodules, some specimens with additional orange-brown lines on spiral cords, columellar callus white, aperture chocolate-brown and banded with white, protoconch frequently dark brown. Operculum brown and serrate or occasionally simple at margins.

TYPE LOCALITY. None. Singapore, Malaysia, is here designated as the type locality (specimens in AMS and ZMC).

DISTRIBUTION. From Thailand to the Philippines and the Fiji Is. In clean and muddy sand, from the intertidal zone to a depth of 11 m.

Type specimens. The holotype of *N.crenoliratus* (A.Adams) is in the British Museum (N.H.), London, No.197330, length 9.8 mm, width 6.1 mm.

Material examined. THAILAND: Koh Kahdat near Koh Kut, 11 m (ZMC); Phuket (coll.J.Orr); MALAYSIA: Singapore (AMS; ZMC); S.of Pulau Langkawi, Kedah (coll.McCausland); Pulau Hantu, S.W.Keppel Harbour (USNM); INDONESIA: Pasir Putih, near Panjang, E. of Tanjung Karang, Lampung Province, Sumatra; between Palu and Donggala, Sulawesi; N.E.coast of Bangka I, Sumatra; Sanur beach, Bali; Pantai Pura, N. of Kupang, W.Timor (all coll.McCausland); Pelau Besar, Malacca Str. (USNM); Tanjong Aru, Jesselton, N.Borneo (SDMNH); PHILIPPINES: Ilo Ilo, Panay I (SDMNH; USNM); Matabungkai, *c.* 115 km S.W.W. of Manila (AMS); Tilig, Lubang I (USNM); PAPUA NEW GUINEA: Port Glasgow (AMS); Kapa Kapa, *c.* 72 km S.E. of Port Moresby; near Yule I, Gulf of Papua (both coll.Ritter); AUSTRALIA: Michaelmas Cay, Queensland (AMS); NEW HEBRIDES: Lelepa, Efate I (coll.Bratcher); FIJI IS: Malolo Barrier reef, Mamanuca group; Manava I, N. off Viti Levu; Suva reef, S.Viti Levu (all coll.Eker); S.of Cave I, Suva Bay, 18°07'S & 178°23'E (ZMC); Suva Pt., S.Viti Levu (USNM); Vanga Bay, Beqa I (LACM); Nadi Bay (SDMNH; AMS); Lami, Suva (coll.McCausland).

Nassarius (Niotha) delicatus (A.Adams, 1852)
(Plate 14, figs.4-8)

1852. *Nassa delicata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:99; 1854 Reeve, Conch.Icon. 8:pl.27, figs.180a,b; 1876 E.A.Smith, J.Linn.Soc.Lond. 12:546; 1877 Brazier, Proc.Linn.Soc.N.S.W. 1:178; 1887 v.Martens, J.Linn.Soc.Lond. 21:182; 1934 Mari, J.Conchyl. 78:13.
1852. *Nassa nodicostata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:99; 1853 Reeve, Conch.Icon. 8:pl.15,figs.97a,b; 1885 Cooke, Ann.Mag.Nat.Hist. (5), 15:327; 1934 Mari, J.Conchyl. 78:14.
1904. *Nassa (Phrontis) tiarula* (Kiener), Sturany, Denk.k.Akad.Wiss.math.-nat. Wien 74:243 (non *Buccinum tiarula* Kiener, 1841 = *Nassarius*).
1911. *Nassa (Phrontis) delicata* A.Adams, Schepman, Siboga-Exped. 49d:322.
1918. *Alectryon (Phrontis) alcimus* Melvill, Ann.Mag.Nat.Hist. (9), 1:139, pl.4,fig.2.
1930. *Nassarius delicatus* (A.Adams), Bisacchi, Ann.Mus Civ.Stor.Nat.Genova 55:45.
1930. *Phrontis nodicostata* (A.Adams), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:65.
1978. *Nassarius (Niotha) delicatus* (A.Adams), Cernohorsky, Trop.Pacific mar.shells p.83, pl.25,fig.7.

Shell up to 15.0 mm in length but frequently smaller, teleoconch of 3½-4¾ convex whorls, protoconch of 3½-3¾ finely carinate, milky embryonic whorls; sculptured with strong rounded axial ribs, ribs on last whorl either thick or slender, smooth or nodulose; spiral sculpture consists of fine spiral striae which often become obsolete, a presutural groove which separates sutural nodules from axial ribs, base of shell with 4-6 granulose, wavy spiral cords. In some individuals the sutural nodules on the body whorl can be moderately echinate and nodules on axial ribs quite distinct. Aperture narrow, outer lip thick and variced, denticulate-lirate within, columellar callus partly expanding on to body whorl and usually broader above parietal wall, columella denticulate, siphonal and anal canals distinct. White in colour, some individuals marbled or faintly banded with brown, remnants of a band usually visible on the varix, many specimens stained purple-brown on the dorsal side of the siphonal canal, occasional specimens with an interrupted brown peripheral line on body whorl, columellar callus and aperture white. Operculum brown and serrate at margins.

TYPE LOCALITY. Albay, Luzon, Philippines, 11 m *(delicata)*; Corregidor I, Philippines, 11 m *(nodicostata)*; Mekran coast, Persian Gulf *(alcimus)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf to the Ryukyu and Fiji Is. In clean and weedy coral sand, rarely intertidal, usually from 2-403 m.

Type specimens. The following types are in the British Museum (N.H.), London: four syntypes of *N.delicatus* (A.Adams), No.197332, and the syntype measuring length 9.8 mm, width 6.0 mm, is here selected as the lectotype (pl.14,fig.4); the holotype of *Nassa nodicostata* A.Adams, No.1973127, length 13.6 mm, width 8.3 mm, and the holotype of *Alectryon alcimus* Melvill, No.,1921.1.28.2, length 15.0 mm, width 8.8 mm.

Material examined. RED SEA: Dahlak Archipelago, 15°17'N & 40°10'E, 18-36 m; El Hamira Bay, 2-4 m; off Gzeirat, 50 m; off Mersat Abu Samra, 51-53 m; off Nuweiba, 329-403 m; Masra el Et, Gulf of Aqaba; Sharm el Maya, Gulf of Aqaba (all TAU); Gulf of Suez (USNM); Eilat, Gulf of Aqaba (TAU; USNM); S.side of Dissel I, 25 km off Massena, 4-5 m (AMS); 5-8 km S. of Aqaba (coll.Mastaller); PERSIAN GULF: Mekran coast (BMNH); MADAGASCAR: Tulear (SMOM); MAURITIUS: (AMS); INDONESIA: Bali Sea, 7°15'S & 115°15.6'E, 289 m; reef near Batjulmati, Java, 15 m; Lumu Lumu shoal, Borneo Bank, 34 m; Banda, 9-45 m; Bay of Pidjot, Lombok, 22 m; Sulu Harbour, Sulu I, 14 m; Tual Kai Is, 22 m; Kwandang Bay entrance, 75 m (all ZMA); N.of du Rowa, N. of Nuhu Rowa, Kai Is, 33-37 m; off Tg Tutuhuhur, Piru Bay, Ceram, 26-48 m (both WAM); Tamandjaijai, Bantam, Java (USNM); PHILIPPINES: off Tinakta I, Tawi Tawi group, 18 m; off Bakun, Tawi Tawi (both USNM); RYUKYU IS: Bolo Pt., Okinawa (coll.Deynzer); PAPUA NEW GUINEA: Luai I, Trobriand group (AMS); Escape Bay, Rabaul, New Britain (coll.Parkinson); NEW HEBRIDES: Malapoa Pt., Efate I (coll.Bratcher); LOYALTY IS: Ouvea I (coll.Coles); Lifu I (coll.Boust); FIJI IS: Main reef, Suva, S.Viti Levu (coll.Northgrove); Lakeba I, Lau group (AIM).

Melvill (1918) suspected that his *Nassarius alcimus* may be only a local variant of *Nassa nodicostata* Adams, but the form *alcimus* is closer to the typical form of *delicatus* and is the prevalent form in the Red Sea and the Persian Gulf region. The more nodulose form *nodicostata* occurs more frequently towards the Eastern Indian Ocean and Western Pacific.

Nassarius (Niotha) persicus Cox, 1936 [nom.praeocc.]
(Fig.112)

1936. *Nassarius persicus* Cox, Palaeont.Indica, Calcutta 22:40, pl.8,figs.19a,b (non *Nassa persica* v.Martens, 1874 = *Nassarius*).

TYPE LOCALITY. Nur Mohammadi, Mekran beds, Pliocene of Iran.

The species does not appear to be separable from *N.delicatus* (A.Adams). *Nassarius persicus* Cox, 1936, in addition to being a probable synonym, is also a secondary homonym of *Nassa persica* v.Martens, 1874, which is a valid species known in the combination *Nassarius (Plicarcularia) persicus* (v.Martens).

Nassarius (Niotha) ecstilbus (Melvill & Standen, 1896)
(Plate 14, figs.9,10; Plate 15, fig.1)

1896. *Nassa (Telasco) ecstilbus* Melvill & Standen, J.Conch. 8:274, pl.9, fig.4.
1903. *Nassa ecstilba* M. & S., E.A.Smith, Fauna Geog.Maldive & Laccad. 2(2):608.
1908. *Nassa gerstenbrandti* Preston, Rec.Indian Mus.Calcutta 2:194,pl.14,fig.7.
1938. *Nassa (Zeuxis) ecstilba* M. & S., Lamy, Mem.I'Inst.Egypt 37:50.
1972. *Nassarius (Niotha) ecstilbus* (Melvill & Standen), Cernohorsky, Rec.Auckland Inst.Mus. 9:155, fig.71; 1978 Cernohorsky, Trop.Pacific mar.shells p.83, pl.25,fig.8.

Shell up to 11.0 mm in length but frequently smaller, solid, teleoconch of 4-5 convex whorls, protoconch of 3¼-3½ finely carinate, white embryonic whorls; sculptured with a few or more numerous, strong, rounded axial ribs which continue to the outer lip of the body whorl; spiral sculpture of numerous, very fine, frequently macroscopic punctate spiral striae which are obsolete on spire whorls but are prominent in interspaces on the dorsal side of the body whorl, base of last whorl with 6-7 crisp spiral cords. Aperture narrow, outer lip thick, variced and denticulate on edge, columellar callus partly spreading on to body whorl, columella finely denticulate, siphonal and anal canals distinct. Either uniformly white or sometimes ornamented with orange-brown spots in interspaces of nodules and an interrupted orange-brown line just posterior to sutures on spire whorls, body whorl also spotted between nodules, centre of whorl with an interrupted orange-brown line, base of shell with a broad orange-brown band, band sometimes nebulous and only visible as 2 orange-brown streaks on the varix, columellar callus and aperture white. Operculum brown and finely serrate at margins.

TYPE LOCALITY. Lifu, Loyalty Is *(ecstilbus)*; Andaman Is, 13-18 m *(gerstenbrandti)*.

DISTRIBUTION. From the Red Sea to the Andaman Is, Philippines and the Fiji Is. In clean coral sand, from the intertidal zone to a depth of 4 m and more.

Type specimens. The holotype of *N.ecstilbus* (Melvill & Standen), is in the University of Manchester Museum, length 9.8 mm, width 5.0 mm. The holotype of *Nassa gerstenbrandti* Preston, is in the Zoological Survey of India, Calcutta, length 4.9 mm, width 2.7 mm, and paratypes are in the Institut Royal des Sciences Naturelles de Belgique, Brussels.

Material examined. ANDAMAN IS: (ZSI; Inst.Roy.Sci.Nat.Brussels); INDONESIA: Pulau Siburu, Sumatra (USNM); Sanur beach, Bali (coll.McCausland); PHILIPPINES: Punta Engano, Mactan I, Cebu (coll.Dan); PAPUA NEW GUINEA: Kuai I and Buriwadi I, both Trobriand group (both AMS); AUSTRALIA: Queensland: Lizard I; Lady Musgrave I; Bunker group; E. of Gladstone; Michaelmas Cay; Hastings reef, N. of Cairns, 2-4 m (all AMS); off Cape Flattery, Lizard I, 3 m (coll.Willan); NEW HEBRIDES: Tuki Tuki Pt., Efate I (coll.Colardeau); LOYALTY IS: Lifu I (NMV; SDMNH; USNM); NEW CALEDONIA: False Entrance, reef 10 km N.W. of Noumea (coll.Marrow); FIJI IS: Yanuca I, S.W.Viti Levu (coll.WOC); Astrolabe reef, Yanuyanu-i-Loma I (LACM); Moce I, Lau group (AIM).

N.ecstilbus is similar to *N.delicatus* (A.Adams), but the former is less squat and rotund and lacks the sutural nodules as well as the purple-brown colouring on the dorsal side of the siphonal canal. *N.ecstilbus* never develops a nodose sculpture on the axial ribs, and the siphonal notch is also appreciably narrower.

Nassarius (Niotha) fretorum (Melvill & Standen, 1899)
(Plate 15, figs.2-5)

1852. *Nassa pusio* A.Adams, Proc.Zool.Soc.Lond. Pt.19:100; 1854 Reeve, Conch.Icon. 8:pl.26, figs. 172a,b (non Sowerby, 1847).
1899. *Nassa fretorum* Melvill & Standen, J.Linn.Soc.Lond. 27:159, pl.10,fig.3.
1910. *Nassa ariel* Preston, Rec.Indian Mus.Calcutta 5(2):118, textfig. 2.
1911. *Nassa (Niotha) pusio* (A.Adams), Schepman, Siboga-Exped. 49d:325; 1955 Marche-Marchad, J.Conchyl. 95:34.
1978. *Nassarius (Niotha) fretorum* (Melvill & Standen), Cernohorsky, Trop.Pacific mar.shells p.82, pl.25,fig.2.

Shell up to 12.0 mm in length but frequently smaller, elongate-ovate to ovate, teleoconch of 3½-4½ convex whorls, early spire whorls angulate at sutures, protoconch of 3¼-3½ glassy white, finely carinate embryonic whorls; sculptured with slender or moderately broad axial ribs, ribs close-set, usually becoming thinner and more numerous towards the outer lip; interspaces very narrow and sculptured with very fine spiral striae, lower third of body whorl with 6-7 rugose spiral cords and a deeper presutural groove forms a row of sutural nodules which are not in any way larger than the axial ribs themselves.

Aperture moderately narrow, outer lip variced, denticulate-lirate within, columellar callus partly spreading on to body whorl and frequently thinning above parietal wall, columella with few obsolete denticles. White to cream in colour, usually only sparsely spotted with brown at sutures, but some individuals brightly coloured and ornamented with rhomboidal orange-brown sutural spots, a central line of small spots and a broader, irregular, dilacerated basal band, columellar callus and aperture white.

TYPE LOCALITY. Warrior I, Torres Strait, Australia *(fretorum)*; Sorsogon, Albay, Luzon I, Philippines (*pusio* A.Adams); Balasore Bay, India *(ariel)*.

DISTRIBUTION. From India to the Philippines and N.E. Australia. In sand, subtidal, to a depth of *c.* 200 m (the specimen from 522 m was devoid of animal).

Type specimens. The holotype of *N.fretorum* (Melvill & Standen) is in the British Museum (N.H.), London, No.1899.2.36.26., length 11.5 mm, width 6.8 mm. Two syntypes of *Nassa pusio* A.Adams, are in the same Institution, No.1973130, and the specimen measuring length 7.8 mm, width 4.8 mm, is here selected as the lectotype (pl.15, fig.3). The holotype of *N.ariel* Preston is in the Zoological Survey of India, No.M-4679/1, length 7.4 mm, width 4.7 mm.

Material examined. INDIA: Balasore Bay (ZSI); INDONESIA: S. of Bali 8°46'S & 115°15'E, 19 m; S. of Doe Roa, Moluccas (both ZMC); Sulu Archipelago, 5°43.5'N & 119°40'E, 522 m; Sapeh Strait, 69 m; Madura Bay, 69-91 m (all ZMA); PHILIPPINES: Jolo Sea, 37-55 m; Tubajon Bay, 10°20'N & 125°32'E, 40 m (both ZMC); Punta Engano, Mactan I, Cebu, *c.* 200 m (coll.Marrow); Balabac I, 124 m (AMS); PAPUA NEW GUINEA: Madang (coll.Bratcher); AUSTRALIA: S. of Fraser I, Queensland (coll.Richter); Black I, Langford reef near Bowen, Queensland, 18 m (AMS).

Nassarius (Niotha) obesus (G. & H. Nevill, 1875)
(Plate 15, figs.6-8)

1875. *Nassa obesa* G. & H. Nevill, J.Asiatic Soc.Bengal, N.S., 44(2):95, pl.8, figs.2,3.
1875. *Nassa obesa* var. *ceylonica* G. & H. Nevill, J.Asiatic Soc.Bengal, N.S., 44(2):96.
1901. *Nassa (Alectryon) obesa* G. & H.Nevill, Melvill & Standen, Proc.Zool.Soc.Lond. 2:411.
1901. *Nassa (Alectryon) eranea* Melvill & Standen, Proc.Zool.Soc.Lond. 2:409, pl.23, fig.11.
1909. *Nassa shawi* Preston, Rec.Indian Mus.Calcutta 3:137, pl.22,fig.16.

Shell up to 22.0 mm in length but some specimens only half this size, globosely conical, solid, last whorl rotund, teleoconch of 5-6 whorls, protoconch of 3 glassy, carinate embryonic whorls, sculptured with thick axial ribs which number from 16-18 on the penultimate and from 18-21 on the body whorl, ribs occasionally obsolete on the dorsal side of body whorl but becoming more crowded towards outer lip; spiral sculpture consists of spiral grooves and threads, 2-3 cords anterior to suture of body whorl rugose, grooves becoming obsolete on centre of body whorl, base of shell with 7-10 cords. Aperture narrow, outer lip thick and with 6-7 strong denticles within, columellar callus spreading on to body whorl and frequently thinning above parietal wall, columella with 2-6 denticles, siphonal and anal canals distinct. Uniformly brown to tan in colour, some individuals minutely and indistinctly mottled with white, columellar callus and aperture white.

TYPE LOCALITY. Kutch, India *(obesus)*; Ceylon and Penang *(ceylonica)*; Persian Gulf *(eranea)*; Ceylon *(shawi)*.

DISTRIBUTION. From the Persian Gulf to India and Malaysia.

Type specimens. The types of *N.obesus* (G. & H.Nevill), and var. *ceylonica* (G. & H.Nevill) have not been located in the Zoological Survey of India, Calcutta (Dr.Subba Rao, *in litt.*), but the excellent original description and type figures (pl.15, fig.6) clearly identify the species. The original dimensions given for *N.obesus* were length 22.0 mm, width 14.0 mm, and for var. *ceylonica* length 19.0 mm, width 10.0 mm. The holotype of *Nassa eranea* Melvill & Standen, is in the British Museum (N.H.), London, No.1901.12.9.160, length 12.1 mm, width 7.4 mm. The holotype of *N.shawi* Preston, is in the same Institution (no number), length 8.3 mm, width 5.2 mm.

Material examined. Apart from the type specimens, no other specimens have been seen.

Nassarius (Niotha) jactabundus (Melvill, 1906)
(Plate 15, figs.9,10)

1906. *Nassa (Alectryon) jactabunda* Melvill, Proc.Zool.Soc.Lond. 7:76, pl.7,fig.17.

Shell up to 20.0 mm in length, elongate-ovate, body whorl occasionally broad, spire acuminate, teleoconch of 5-6 convex whorls, protoconch of 3-3½ glassy, prominently carinate embryonic whorls, upper spire whorls angulate at sutures; sculptured with slender axial ribs which are bisected by numerous spiral cords which render ribs nodulose; sutural nodules slightly more prominent and frequently with 2 stronger spiral cords anterior to sutures giving the impression of paired sutural nodules. Aperture narrow, outer lip thickened and denticulate within, columellar callus expanding on to body whorl,

either well-bordered or spreading and slightly thinning above parietal wall, lower half of columella denticulate, siphonal and anal canals distinct. White to pale straw-yellow in colour, sometimes ornamented with 2 moderately broad brown bands on body whorl, columellar callus and aperture white.

TYPE LOCALITY. Persian Gulf.

DISTRIBUTION. From the Red Sea to the Persian Gulf and Pakistan. In sand, usually subtidal to a depth of 13 m.

Type specimens. The holotype of *N.jactabundus* (Melvill), is in the British Museum (N.H.), London, No.1906.6.13.17., length 19.3 mm, width 11.1 mm.

Material examined. RED SEA: Eilat, Gulf of Aqaba (TAU); PERSIAN GULF: Reden near Bushire, 3-5 m; St.18, S. of Boridini, 13 m; Bushire, 6 m (all ZMC); GULF OF OMAN: Jask (coll.Redfield); PAKISTAN: Karachi (coll.Melvill).

The species is very similar to *N.obesus* (G. & H.Nevill), but differs by its coarser appearance, angulate spire whorls, numerous overriding spiral threads and colouring.

Nassarius (Niotha) sinusigerus (A.Adams, 1852)
(Plate 16, figs.1-10)

1852. *Nassa sinusigera* A.Adams, Proc.Zool.Soc.Lond. Pt.19:100; 1853 Reeve, Conch.Icon. 8:pl.17, figs.275,276; 1885 Cooke, Ann.Mag.Nat.Hist. (5), 15:327; 1907 Schepman, Samml.geol.Reichs-Mus.Leiden (1), 8:175, 1934 Mari, J.Conchyl. 78:15.
1860. *Nassa beata* Gould, Proc.Boston Soc.Nat.Hist. 7:330; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:46, fig.7 (not fig.5) [figd. holotype].
1874. *? Nassa (Niotha) sinusigera* var. *cernica* G. & H.Nevill, J.Asiat.Soc.Bengal, N.S., 43(2):25, pl.1,figs.7,7a.
1877. *Nassa abyssinica* Marrat, Prop.new forms gen.*Nassa* p.8; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:35.
1899. *Nassa aracanensis* E.A.Smith, Ann.Mag.Nat.Hist. (7), 4:243; 1901 E.A. Smith in Anandale & Stewart, Illust.Zool.Invest., Moll.Pt.6:pl.11, figs.2,2a.
1900. *? Nassa lathraia* Sturany, Anz.k.Akad.Wiss.math.-nat.Wien No.17:200; 1903 Sturany, Denk.k.Akad.Wiss.math.-nat.Wien 74:224, pl.2,figs.1a,b; 2a,b.
1901. *Nassa (Alectryon) collaticia* Melvill & Standen, Proc.Zool.Soc.Lond. 2:409, pl.23,fig.10.
1903. *Nassa (Hima) sinusigera* (A.Adams), Surany, Denk.k.Akad.Wiss.math.-nat.Wien 74:244; 1911 Schepman, Siboga-Exped. 49d:324; 1929 Dautzenberg, Faune Colon.Franc. 3:413.
1911. *Nassa (Alectryon Aciculina ?) ovoidea* var. *brevis* Schepman, Siboga-Exped. 49d:317 (non Bellardi, 1882).
1916. *Nassa phoenicensis* Preston, Rec.Indian Mus.Calcutta 12:89, textfigs.2,2a.
1928. *Nassarius (Alectrion) collaticia* Melvill, Proc.Malac.Soc.Lond. 18:106.
1930. *Niotha sinusigera* (A.Adams), Bisacchi, Ann.Mus.civ.Stor.Nat.Genova 55:65.
1930. *Nassarius (Hima) aracanensis* (Smith), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:60.
1939. *Nassarius (Telasco) sinusigerus* (A.Adams), Oostingh, Ing. Ned-Indie Mijnb.Geol. 6(12):176, pl.16,figs.275,276.
1969. *Nassarius (Zeuxis) macrocephalus greyanus* Shuto, Mem.Fac.Sci.Kyushu Univ. ser.D, Geol. 19:134, pl.14,figs.1-5, textfigs.27,28.
1978. *Nassarius (Niotha) sinusigerus* (A.Adams), Cernohorsky, Trop.Pacific mar.shells p.85, pl.26,fig.4.

Shell up to 15.0 mm in length but frequently only half this size, solid, elongate-ovate to almost squat, teleoconch of 4-6 convex whorls, protoconch of 2½-3¼ glassy, carinate, embryonic whorls; sculptured with few to numerous axial ribs which are either continuous to the back of the outer lip or become obsolete on the dorsal side of the body whorl; in some specimens spiral sculpture is almost absent on the spire whorls and only weakly indicated on the body whorl, while in others spiral striae are quite distinct in interspaces of all whorls; a shallow or moderately deep subsutural groove separates sutural nodules which are either low and rounded or distinctly echinate. Aperture moderately open, outer lip thickened and denticulate within, varix frequently swept upwards in profile, columellar callus moderately narrow and regularly convex but sometimes slightly spreading above parietal wall, columella denticulate, siphonal canal moderately short or slightly produced. White to cream in colour, usually ornamented with one row of reddish-brown spots in interspaces of sutural nodules, another row of spots adjacent to sutures on spire whorls and 2 additional interrupted reddish-brown bands on body whorl, columellar callus and aperture white. Operculum brown and usually with only 1 or 2 denticles on either side of margin.

TYPE LOCALITY. Catbalonga, Samar I, 15 m *(sinusigerus)*; Loo Choo Is = Okinawa, Ryukyu Is *(beata)*; Mauritius *(cernica)*; Abyssinia *(abyssinica)*; Reef I, Kyuk Phon, off Arakan coast *(aracanensis)*; off the coast of Pakistan, 25°N & 63°E, 46 m *(collaticia)*; S.E. of Akik Seghir, Red Sea, 17°26'N & 39°19'E, 332 m *(lathraia)*; Phoenix Bay, Andaman Is, 2-5 m *(phoenicensis)*; St.306, Flores Sea, Indonesia, 8°27'S & 122°56.5'E, 247 m (*brevis* Schepman); Panay I, Neogene of the Philippines *(greyanus)*.

DISTRIBUTION. From the Red Sea and the Gulf of Oman to Madagascar, India, the Ryukyu Is and the Fiji Is. In mud and muddy sand, subtidal, from 10-525 m.

Type specimens. Three syntypes of *N.sinusigerus* (A.Adams), are in the British Museum (N.H.), London, No.1973128, and the syntype measuring length 11.7 mm, width 6.5 mm, is here selected as the lectotype (pl.16, fig.1). The holotype of *Nassa beata* Gould, is in the National Museum of Natural History, Washington, No.C-2018, length 10.4 mm, width 5.8 mm. Six syntypes of *N.abyssinica* Marrat, are in the Merseyside County Museum, Liverpool, and the specimen measuring length 8.1 mm, width 4.7 mm, is here designated as the lectotype (pl.16, fig.5). The holotype of *N.collaticia* Melvill & Standen, is in the British Museum (N.H.), London, No.1901.12.9.157., length 8.2 mm, width 4.6 mm, and the holotype of *N.phoenicensis* Preston, is in the Zoological Survey of India, Calcutta, No. M-9807/2, length 7.2 mm, width 4.0 mm, and the holotype of *Nassarius greyanus* Shuto, is in the Geology Dept., Kyushu University, Japan, length 10.5 mm, width 7.3 mm, and a syntype of *N.brevis* Schepman, is in the Zoological Museum, University of Amsterdam, length 7.0 mm, width 3.8 mm. The type specimens of *N.lathraia* Sturany, *N.cernica* G. & H.Nevill, and *N.aracanensis* E.A.Smith, have not been located at their respective Institutions.

Material examined. RED SEA: Dahlak Archipelago, 15°18'N & 40°23'E, 27-110 m; Eilat, Gulf of Aqaba, 40-49 m; Ras-a-Tantur; El Hamira Bay, 30-47 m; off Mersat Abu Samra, 49-50 m; Taba, Gulf of Aqaba (all TAU); GULF OF OMAN: S.W. of Jask, 68 m (BMNH); PAKISTAN: Karachi (coll.Powell); MADAGASCAR: Tulear, 112 m (SMOM); INDIA: off Tranquebar, 11°06'N & 80°05'E, 28 m; off Ganges Delta, 20°49'N & 88°40'E, 75 m (both ZMC); SRI LANKA: Trincomalee (ZMC); N.W. coast of Sri Lanka, 9-307 m (AMS); ANDAMAN IS: Phoenix Bay (ZSI); MALAYSIA: Singapore (USNM); INDONESIA: Samalona, Macassar, Celebes, 35 m; Doelah, Kai Is, 50 m both (ZMC); Jamdena Str., E. of Wotap I, Tanimbar, 64-73 m; Teluk Dondinga near Ternate, Halmahera, 31-42 m; W.coast of Wasir I, W.Wokam, Aru I, 22-46 m (all WAM); Carita beach, N.of Labuan, W.Java (coll. McCausland); PHILIPPINES: off Mantataquin I, E. of Palawan group, 49 m; off S.E. Tawi Tawi, 33 m; N.E of Simonor I, 17 m; off Tocanhi Pt., Tawi Tawi group, 90 m; N. of Corregidor I, 68 m; off Arena Pt., Luzon, 525 m; off Jolo, 37 m; N. of Basilan, 143 m (all USNM); off Bantayan I, 55 m (coll.Norton); RYUKYU IS: Okinawa (USNM); PAPUA NEW GUINEA: Port Moresby Bay, 10-15 m (ZMC); off wharf, Fairfax Harbour, Port Moresby, 15-18 m; S.W. of Yule I; Port Glasgow, 11 m (all AMS); Laing I, Hansa Bay, 35 m (coll.Tursch); SOLOMON IS: Kieta, Bougainville (coll. Whitehead); NEW HEBRIDES: Erakor lagoon, Efate I (coll. Willan); FIJI IS: Main Suva reef, Sth.Viti Levu (coll.Northgrove).

Fossil record. PLIOCENE: Tjimantjeuri, S.Bantam, Java, Indonesia; PLEISTOCENE: Kajoeragi, Menado, Celebes, Indonesia (both Oostingh, 1939).

The species is extremely variable in shape and sculpture, and end-members of the varietal chain could be easily mistaken for separate species. From all the material available to me, I have been unable to find a single diagnostic character of a constant nature by which I could distinguish two distinct biospecies. Schepman (1911) made the following comment on this species: "varying in nearly every respect, in size, shape (more or less elongate), number and development of ribs, some specimens being nearly smooth on last whorls, others more or less closely ribbed, in colour, distinctness and breadth of the band. However, it is impossible for me to separate them." Bisacchi (1930) placed *collaticia* Melvill & Standen in synonymy of *N.aracanensis* E.A.Smith, while Tomlin (1940) placed *aracanensis* E.A.Smith, *N.collaticia* Melvill & Standen, and *N.himeroessa* Melvill & Standen, in synonymy of *N.abyssinica* (Marrat). I agree with Tomlin's synonymy but would exclude *Nassarius himeroessus* as a distinct species.

N.sinusigerus occurs in 3 forms: the typical form *sinusigerus* A.Adams, which lacks spiral sculpture on spire whorls and only obsolete striae are present on body whorl, and the axial ribs have a tendency to become obsolete on the dorsal side of the body whorl, and the banding is weak and nebulous. *Nassa beata* Gould and *Nassarius greyanus* Shuto, belong to the typical form which occurs most frequently in the Indonesian-Philippine region.

The form *abyssinica* is characterised by its distinct spiral sculpture and somewhat echinate sutural nodules. *Nassa collaticia* Melvill & Standen, and probably *N.lathraia* Sturany, belong to this form, while *N.phoenicensis* Preston, is intermediate between the typical *sinusigerus* and *abyssinica* forms, and usually occurs throughout the species range. The small, squat, striate *aracanensis* form occurs more frequently in the western Indian Ocean.

Nassa sinusigera var. *cernica* G. & H.Nevill, does not appear to belong to *N.sinusigerus* on the basis of the type-figure which resembles *N.delicatus* (A.Adams) more so than *N.sinusigerus*. *Nassa ovoidea* var. *brevis* Schepman, is not the same species as *Nassa ovoidea* Schepman (= *Nassarius idyllius* Melvill & Standen), but is a small individual of the *phoenicensis* form of *N.sinusigerus*. Schepman's epithet is a primary homonym of *Nassa brevis* Bellardi, 1882.

Nassarius (Niotha) bantamensis Oostingh, 1933
(Fig. 113)

1933. *Nassarius (Alectrion) bantamensis* Oostingh, De Mijningenieur 14:194, textfig. 2.
1939. *Nassarius (Hima) bantamensis* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):176, pl.14,figs.249,250.

Shell small, maximum size 8.0 mm, protoconch conoidal and consisting of 3 smooth embryonic whorls which are weakly carinate; post-embryonic whorls 3½, sculptured with slender axial riblets which number 14 on the earlier whorls, and a subsutural groove which gives rise to small sutural nodules; interspaces with fine spiral grooves numbering 3-5, base of shell with *c.* 7 spiral threads. Aperture small, outer lip thickened and denticulate-lirate within, columellar callus moderately narrow and finely denticulate on anterior half (condensed original description).

TYPE LOCALITY. St.766, Tjibatoerandjang, South Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type of *N.bantamensis* Oostingh, is probably in the Museum of Bandoeng, Indonesia. The original dimensions were length 7.5 mm, width 4.5 mm.

The species appears to be closely similar to the *aracanensis* form of *N.sinusigerus* (A.Adams), a species which is also known from Pliocene deposits of Indonesia.

Nassarius (Niotha) beureumensis Oostingh, 1939
(Fig. 114)

1939. *Nassarius (Zeuxis) beureumensis* Oostingh, Ing.ned.-Indie Mijnb.Geol. 6(12):181, pl.16,fig.282.

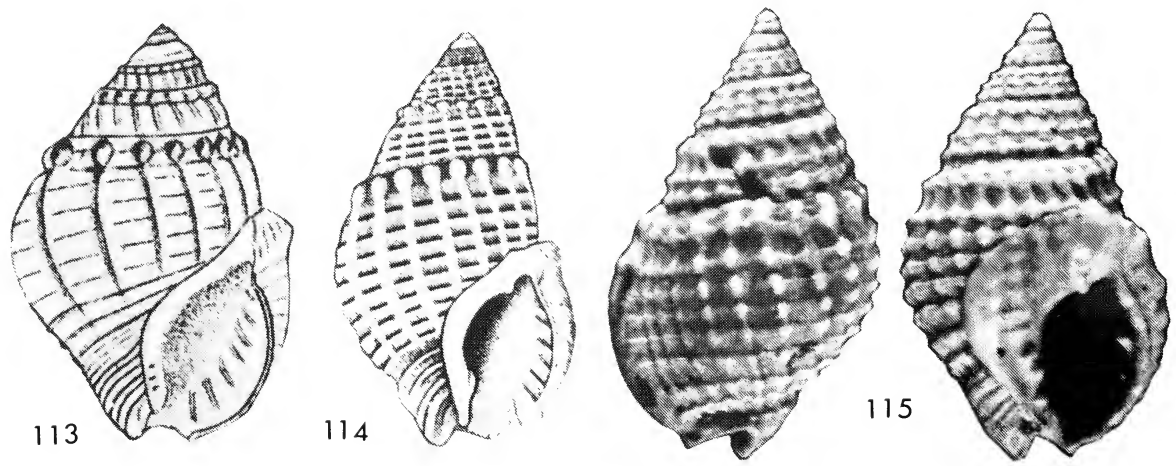
Shell up to 12.0 mm in length, oviform with a high spire, teleoconch of 3¾-4¼ weakly convex whorls, protoconch of at least 3 smooth embryonic whorls, earliest whorl finely carinate; sculptured with slender axial ribs which number from 17-22 on the spire whorls and 15-19 on later whorls; subsutural groove produces rounded sutural nodules, remaining spiral sculpture appearing as grooves in the interspaces, siphonal fasciole with a few oblique cords. Aperture narrow, varix weakly developed, outer lip with 11 lirae, columellar callus moderately narrow and well-bordered, columella anteriorly with a few denticles, siphonal and anal canals well developed (condensed original description).

TYPE LOCALITY. St.980, Tjirantjabeureum, South Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type is probably in the Museum of Bandoeng, Indonesia. The original measurements were length 11.6 mm, width 6.7 mm.

This species is similar to the *abyssinicus* form of *N.sinusigerus* (A.Adams).



Figs. 113-115. Fossil Nassariinae. 113. *Nassarius (Niotha) bantamensis* Oostingh. Type-figure; 7.5 mm (after Oostingh, 1933, textfig. 2). 114. *N. (N.) beureumensis* Oostingh. Type-figure; 11.6 mm (after Oostingh, 1939), pl.16, fig.282). 115. *N. (N.) beberkirianus* (Martin & Icke). Lectotype Rijksmuseum van Geologie en Mineralogie, Leiden, RGM-9528; 8.3 mm.

Nassarius (Niotha) albinus (Thiele, 1930)
(Plate 16, figs.11,12)

1930. *Nassa albina* Thiele, Fauna Suedwest-Australiens 5(8):584, pl.4,fig.58.

Shell up to 12.0 mm in length, elongate-ovate, solid, body whorl frequently broad, teleoconch of 5½-6¼ convex whorls, protoconch of 1½ smooth, glassy embryonic whorls; sculptured with strong, broad and rounded axial ribs, ribs becoming more slender and numerous on the dorsal side of the body whorl; spiral sculpture consisting of short spiral grooves in moderately narrow interspaces, 5-6 grooves towards the base continuous, a deep, wavy subsutural groove gives rise to strong sutural nodules. Aperture narrow, outer lip thickened and variced and with 5-9 small denticles within, columellar callus narrow, laminated basally and with 3-5 small denticles anteriorly, siphonal and anal canals distinct. White in colour, usually with an interrupted reddish-brown peripheral line on body whorl, some specimens irregularly maculated with reddish-brown on the dorsal side, columellar callus and aperture white. Operculum brown and serrate at margins.

TYPE LOCALITY. Shark's Bay, southwest Australia.

DISTRIBUTION. Western Australia. On sand-bars, intertidal.

Type specimens. Syntypes of *N.albinus* (Thiele) are in the Zoological Museum, Humboldt University, Berlin, and the illustrated syntype measuring length 10.5 mm, width 6.5 mm, is here selected as the lectotype (pl.16, fig.11).

Material examined. AUSTRALIA: Western Australia: S.W. of Northwest Cape; Shark Bay; N.of Dampier (all coll.Hansen); Roeburn (Natal Mus.); 27 km S. of Exmouth town, Exmouth Gulf; Point Cloates lighthouse beach, Northwest Cape; Denham, Sharks Bay; Monte Bello I; Bandicoot Bay, Barrow I, 20°52'S & 115°19'E; E.side of Exmouth town (all AMS).

The species is closely similar to *N.sinusigerus* (A.Adams), and differs only by the slightly wider axial ribs and body whorl, and more importantly, by the presence of a 1½ whorled non-carinate protoconch.

Nassarius (Niotha) rehderi Cernohorsky, 1980
(Plate 16, figs.13,14; Plate 17, fig.1)

1980. *Nassarius rehderi* Cernohorsky, Rec.Auckland Inst.Mus. 17:121, figs. 18-23 (shell), fig.26 (protoconch), fig.27 (radula).

Shell up to 8.0 mm in length, elongate-ovate, solid, width 49%-59% of length, teleoconch of 3¾-4¼ convex whorls, protoconch of 3½-4 glassy, golden coloured and usually brown-banded, finely carinate embryonic whorls; sculptured with thick axial ribs which are frequently wide-spaced on spire whorls, penultimate whorl with 7-12 ribs, body whorl with 9-12 ribs; spiral sculpture consists of crisp, overriding spiral threads which are most prominent at posterior half of the whorls and number from 8-12 on the penultimate and from 13-23 on the body whorl. Aperture narrow, outer lip thickly variced and with 8-12 small, lirate denticles within, columellar callus spreading as a thin glaze across body whorl but not reaching suture, callus thicker anteriorly, anterior half of columella denticulate, siphonal notch deep, anal canal distinct. Variable in colour, usually brown with white axial ribs and varix, centre of body whorl with a white zone which contains an interrupted spiral band of spots, band occasionally bordered by fine brown lines, some individuals creamy-white and with only the central band of spots; aperture porcellaneous-white, anterior tip of outer lip with a purple-brown blotch which extends on to the back of the varix. Operculum brown, corneous, margins either minutely serrate or simple.

TYPE LOCALITY. Baié de Matavai, N.E. of Tahiti, French Polynesia, 1-12 m.

DISTRIBUTION. Known only from Tahiti, Society Is, French Polynesia.

Type specimens. The holotype of *N.rehderi* Cernohorsky, is in the Auckland Institute and Museum, No.TM-1366, length 7.8 mm, width 4.1 mm.

Material examined. SOCIETY IS: Baié de Matavai and Hitiaa, Tahiti (AIM and other Museums).

Nassarius (Niotha) himeroessa (Melvill & Standen, 1903)
(Plate 17, figs. 2-4)

1903. *Nassa (Alectryon) himeroessa* Melvill & Standen, Ann.Mag.Nat.Hist. (7), 12:306, pl.22,fig.7.
1925. *Nassa innocens* Thiele, Wiss.Ergeb.feut.Tief.-Exped."Valdivia" 17:183, pl.20 (32), fig.12.
1928. *Nassarius (Alectrion) himeroessa* (Melvill & Standen), Melvill, Proc.Malac.Soc.Lond. 18:106.
1978. *Nassarius (Niotha) himeroessa* (Melvill & Standen), Cernohorsky, Rec.Auckland Inst.Mus. 15:57, fig.4.

Shell up to 7.0 mm in length, elongate-ovate to ovate, teleoconch of 2½-3½ convex whorls, protoconch of 3¾-4 glassy, finely carinate, golden embryonic whorls; sutures occasionally narrowly tabulate; sculptured with fine, slender axial riblets, ribs occasionally obsolete on dorsal side of body whorl; spiral sculpture consists of numerous spiral threads, threads most pronounced in interspaces and becoming more cord-like towards base, sutural denticles small but distinct, siphonal fasciole with close-set oblique cords. Aperture small, outer lip varied and with denticles within, columellar callus roundly spreading onto body whorl, sometimes circular, anterior half of columella with a few denticles, siphonal notch distinct. Usually uniformly white to cream in colour, one specimen seen with a narrow pale orange band on body whorl.

TYPE LOCALITY. Gulf of Oman, 13-285 m *(himeroessa)*; near Dar-es-Salaam, East Africa, 6°34.8'S & 39°35.5'E, 404 m *(innocens)*.

DISTRIBUTION. From the Persian Gulf to East Africa, India, Philippines and the Kermadec Is. In sand and gravel, subtidal to a depth of 830 m.

Type specimens. Two syntypes of *N.himeroessa* (Melvill & Standen) are in the British Museum (N.H.), London, No.1903.12.15.69-70., and the specimen measuring length 4.4 mm, width 2.8 mm, is here selected as the lectotype (Pl.17,fig.2). Syntypes of *Nassa innocens* Thiele, are in the Zoological Museum, Humboldt University, Berlin, and the specimen measuring length 6.3 mm, width 3.3 mm, is here designated as the lectotype (Pl.17,fig.3).

Material examined. PERSIAN GULF: 14.4 km W. from Kuh-i-Milarak, 29 m (ZMC); GULF OF OMAN: Pasni, 73 m (ZMC); EAST AFRICA: off Kenya, 4°09'S & 40°19'E, 300 m (ZMC); W. of Glorieuses Is, 11°29'S & 47°17'E, 440 m; E. Bandele reef, Mayotte I, 12°54'S & 45°16'E, 520-830 m; S.W. Grande Glorieuses Is, 11°32'S & 47°16'E, 480-550 m (all MNHNP); INDIA: Karachi (SDMNH); MALAYSIA: near Singapore, 100 m (NSMT); PHILIPPINES: off Simaluc I, Tawi Tawi I, 604 m (USNM); AUSTRALIA: S.E. of Clarence river, New South Wales, 29°41'S & 153°45'E, 405 m (AMS); KERMADEC IS: E. of Chanter I, Raoul I, 29°15'S & 177°50'W, 366-402 m and 29°16'S & 177°49'W, 512-549 m (both NMNZ).

On the label accompanying the syntype of *N.himeroessa* is written "= *agapeta* Watson". *Nassarius agapetus* (Watson, 1882) is also a minute and closely similar species, but is separable on features of more elongate, oviform shape, tighter, non-ledged whorls and a narrower, more regular callus.

Nassarius (Niotha) agapetus (Watson, 1882)
(Plate 17, figs. 5-7)

1880. *Nassa agapeta* Watson, Marrat, Var.shells gen.*Nassa* p.97 (nomen nudum).
1882. *Nassa agapeta* Watson, J.Linn.Soc.Lond. 16:367.
1900. ? *Nassa stiphra* Sturany, Anz.k.Akad.Wiss.math.-nat.Wien 17:200; 1903 Sturany, Denk.k.Akad. Wiss.math.-nat.Wien 74:224, pl.2,figs.3a,b.
1911. *Nassa (Niotha) agapeta* Watson, Schepman, Siboga-Exped. 49d:326.
1916. *Nassa kempi* Preston, Rec.Indian Mus.Calcutta 12:88, textfig.1,1a.

Shell up to 6.5 mm in length, elongate-oviform, shining, teleoconch of 3½-4 whorls, protoconch of 3½ glassy, finely carinate embryonic whorls, sutures tight, not ledged; sculptured with slender axial ribs which are continuous to the back of the outer lip; spiral sculpture consists of very fine spiral grooves in interspaces, grooves becoming spiral threads basally, and a deeper presutural groove forms distinct but small sutural nodules. Aperture small, outer lip prominently varied and denticulate within, columellar callus slightly spreading onto body whorl but regular and bordered, columella minutely denticulate, siphonal notch deep, anal canal distinct. White to cream in colour, spire whorls with an orange-brown band across sutural nodules, body whorl with 1-3 orange-brown bands, columellar callus and aperture white.

TYPE LOCALITY. Levuka, Fiji Is, 22 m *(agapetus)*; Semiramis Bay, Andaman Is, 4-11 m *(kempi)*.

DISTRIBUTION. From Madagascar to the Andaman Is, the Philippines and Fiji Is. In mud, grey and clean coral sand, subtidal to a depth of 91 m.

Type specimens. The holotype of *N.agapetus* (Watson), is in the British Museum (N.H.), London, No.1887.2.9.590, length 5.7 mm, width 3.3 mm, and the holotype of *Nassa kempi* Preston, is in the Zoological Survey of India, Calcutta, length 4.4 mm, width 2.7 mm.

Material examined. MADAGASCAR: Tulear, 18-19 m (SMOM); ANDAMAN IS: (BMNH); INDONESIA: Madura Bay, 69-91 m; Bay of Bima, near South Fort, 55 m; Haingsii, Saman I, Timor reef (all ZMA); S.W. of Bali, 8°26'S & 114°29'E, 70 m (ZMC); PHILIPPINES: E. of Bantayan I, 55 m (coll.Norton); PAPUA NEW GUINEA: between Magulata and Kabulina Points, N.W. coast of Kiriwina I, Trobriand group, *c.* 73 m (AMS); FIJI IS: Levuka, Ovalau I (BMNH).

Nassarius (Niotha) quadrasi (Hidalgo, 1904)

(Plate 17, figs. 8,9)

1853. *Nassa gruneri* Reeve, Conch.Icon. 8:pl.12, fig.75 (non *Buccinum gruneri* Dunker, 1846 = *Nassarius).*
1904. *Nassa quadrasi* Hidalgo, Rev.R.Accad.Cienc.Madrid 1:204 (nom.subst.pro *N.gruneri* Reeve, 1853); 1928 Mari, Butl.Inst.Catalana Hist.Nat. (2), 8:138, pl.6,fig.5; 1934 Mari, J.Conchyl. 78:58.
1961. *Scabronassa quadrasi* (Hidalgo), Habe, Col.illust.shells Japan 2:63, pl.32, fig.3.
1972. *Nassarius (Niotha) quadrasi* (Hidalgo), Cernohorsky, Rec.Auckland Inst.Mus. 9:155, figs.74,75,80, 87 (shell), figs.90,91 (radula) [figd. lectotype]; 1978 Cernohorsky, Trop. Pacific mar.shells p.84,pl.26,fig.1.
1982. *Nassarius quadrasi* (Hidalgo), Kaicher, Card cat. world-wide shells, Pack No.31: card 3211.

Shell up to 18.0 mm in length, solid, elongate-ovate, moderately dull in appearance, teleoconch of 5-6 whorls which are convex on very early whorls and later become angulate at sutures, protoconch of 3¼ finely carinate, glassy embryonic whorls; sculptured with angulate axial ribs and overriding spiral cords which produce 2 primary rows of spines upon the axial ribs on the penultimate and 4 rows of spines on the body whorl; interspaces with 2-4 intermediate spiral threads which produce smaller and less spinose nodules between main spines; in some individuals the spines are reduced to almost round nodules. Aperture narrow and elongate, outer lip thickened and variced, denticulate within, columellar callus moderately narrow and laminate anteriorly, columella denticulate, siphonal and anal canals prominent. White to cream in colour, occasionally flecked or banded with rusty-brown, columella and aperture white or cream, columella frequently flushed with yellow or orange, protoconch white or brown. Operculum brown and serrate at margins.

Radula very variable, inner facing cusp and basal margin of lateral tooth either with or without small denticles.

TYPE LOCALITY. Bohol and Cebu Is, Philippines *(quadrasi* and *gruneri* Reeve).

DISTRIBUTION. From Malaysia to the Ryukyu Is and Samoa Is. In coral sand, from the intertidal zone to a depth of 24 m.

Type specimens. Three syntypes of *N.quadrasi* (Hidalgo) are in the British Museum (N.H.), London, No.197132, and the specimen measuring length 15.1 mm, width 8.8 mm, which has been illustrated by Cernohorsky (1972a, fig.74), is here selected as the lectotype.

Material examined. MALAYSIA: Singapore (ZMC); INDONESIA: Carita beach, N.of Labuan, W.Java (coll.McCausland); VIETNAM: Nhatrang Bay, N. of Honlon, 10-15 m (ZMC); PHILIPPINES: Puerto Galera, Mindanao (ZMC); Ulugan Bay, Palawan group (USNM); Cebu I (coll.Norton); RYUKYU IS: Seragaki, Okinawa I (coll.Deynzer); CAROLINE IS: Palau Is (USNM); PAPUA NEW GUINEA: Panap I, Madang; Rabaul, New Britain; Kronket I (all AMS); Madang (coll.Bratcher); Nordup, E.New Britain, 24 m (coll.Parkinson); Nonga, New Britain (coll.Prior); Laing I, Hansa Bay (coll.Tursch); Raluana village, E.New Britain, 24 m (coll.Parkinson); SOLOMON IS: Haroro; Matui I, Marovo lagoon, New Georgia (both Auckland Univ.); Ugi I (USNM); Lunga Pt., Guadalcanal, 8-12 m (coll.Dillworth); Gaskell, Guadalcanal (coll.Heller); NEW HEBRIDES: Kakula I, Undine Bay; Port Havannah; Malapoa Pt.; Tuku Tuki Pt., all Efate I (all coll.Eker); Sth.Santo I (coll.Taylor); Tutuba I, Espiritu Santo (coll.Coles); Lolowai, Aoba I (coll.Gardner); FIJI IS: Suva reef, S.Viti Levu; Manava I, N. off Viti Levu (both coll.Eker); 6.4 km E. of Sigatoka, S.W. Viti Levu; W. of Rat Tail Passage, Suva reef (both coll.Marrow); Wakaya I near Ovalau I; Nadi Bay, W.Viti Levu; Moce I; Lakeba I and Karoni I, all Lau group (coll.AIM); N. end of Vanua Balavu (coll.Dickinson); Namotu Barrier reef, Mamanuca group (coll.WOC); SAMOA IS: Pilot Pt., Apia; lagoon off Fuailalo, Upolu I, 4-6 m (both coll.Powell); Sogi, Apia, 14 m (coll.Scott).

The species is common in Melanesia and occurs usually in large colonies in sandy lagoons.

Nassarius (Niotha) echinatus (A.Adams, 1852)

(Plate 17, figs. 10,11)

1852. *Nassa echinata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:101; 1853 Reeve, Conch.Icon, 8:pl.20, fig.131; 1879 E.A.Smith, Proc.Zool.Soc.Lond. for 1878:810, pl.50,fig.9; 1886 Watson, Rept.Sci.Res.Voy.H.M.S. "Challenger",Zool. 15:184; 1934 Mari, J.Conchyl. 78:56.
1904. *Nassa quadrasi* var. *alba* Hidalgo, Rev.R.Accad.Cienc.Madrid 1:204 (ref. to E.A.Smith, 1879, pl.50,fig.9) [non Say, 1826].
1911. *Nassa (Hebra) echinata* A.Adams, Schepman, Siboga-Exped. 49d:323.
1939. *Nassarius echinatus* (A.Adams), Peile, Proc.Malac.Soc.Lond. 23:276, fig.46 (radula); 1982 Kaicher, Card cat.world-wide shells, Pack No. 31:card 3229.
1972. *Nassarius (Niotha) echinatus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:157, figs.76,77 (figd.lectotype); figs.79,88 (shell), fig.92 (radula).

Shell up to 15.0 mm in length, slender, elongate-ovate, frequently shining, teleoconch of 5-5¾ whorls, protoconch of 3-3½ finely carinate, glassy embryonic whorls. In other features closely resembling *N.quadrasi* (Hidalgo) but differs in the following features: the surface of the shell is more shin-

ing, the spines are more discreet and noduled at the tips; the body whorl usually has 4 spiral rows of spines but occasionally a fifth row merges with the fourth row anteriorly. Axial ribs are less coarse than in *N.quadrasi* and interspaces completely smooth apart from macroscopic longitudinal striae; spiral cords are only faintly indicated on the body whorl where they are confined to the walls of the axial ribs. Laminated anterior of columella filled with callus and recurved towards aperture which is smaller than in *N.quadrasi*. White in colour, dorsal side frequently stained with orange-brown or completely orange-brown with white nodules, aperture, columella and protoconch white, back of siphonal canal with a horizontally oriented dark brown stain. Operculum brown and serrate at margins.

TYPE LOCALITY. Galeo, Mindoro I, Philippines, 5 m *(echinatus)*; Philippines *(alba* Hidalgo*)*.

DISTRIBUTION. From Madagascar to the Andaman Is, Ryukyu and Fiji Is. In clean coral and muddy sand, from the intertidal zone to a depth of 24 m.

Type specimens. The lectotype (designated Cernohorsky 1972a) of *N.echinatus* (A.Adams), length 14.0 mm, width 7.5 mm, and a paralectotype, are in the British Museum (N.H.), London, No.197131.

Material examined. MADAGASCAR: Grand Récif, Tulear, 12 m, and other stations around Tulear, 4-12 m (SMOM); MAURITIUS: (NMV); ANDAMAN IS: (NMV; ZSI; ZMC); THAILAND: Goh Sindarar Nua (USNM); INDONESIA: Pulau Siburu, S.W. Sumatra; Pulau Melila, Sumatra (both USNM); PHILIPPINES: Mantacao I, Bohol; Sitangkai, Sibutu, Sulu (both USNM); RYUKYU IS: Okinawa I (USNM); PAPUA NEW GUINEA: Buriwadi I, Trobriand group, 18-22 m (AMS); Nordup, E.New Britain, 24 m (coll.Parkinson); AUSTRALIA: off Murray I, Torres Str., 18 m; off N.tip of Casuarina beach, Lizard I (both AMS); NEW HEBRIDES: Port Havannah, Efate I (coll.Eker); Mele Bay, Efate I (LACM); Ile Vate (AMS); FIJI IS: Nadi Bay, W.Viti Levu (AMS).

Nassarius (Niotha) gruneri (Dunker, 1846)
(Plate 18, figs. 1-6)

1846. *Buccinum gruneri* Dunker, Zeit.f.Malakozool. 3:171; 1849 Philippi, Abb.Beschr.Conchyl. 3:63, pl.2,fig.2.
1850. *Nassa acinosa* Gould, Proc.Boston Soc.Nat.Hist. 3:154; 1852 Gould, U.S. Expl.Exped. 12:261, pl.19,figs.329a,b; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:36.
1852. *Nassa hispida* A.Adams, Proc.Zool.Soc.Lond. Pt.19:101; 1853 Reeve, Conch.Icon. 8:pl.6,figs.37a,b.
1854. *Nassa fragum* Rousseau, Voy.Pole Sud.,Zool. 5:83, pl.21,figs.39,40.
1877. *Nassa (Hebra) gruneri* Dunker, Brazier, Proc.Linn.Soc.N.S.W. 1:181.
1883. *Nassa (Hebra) jonkeri* K.Martin, Samml. geol.Reichs-Mus.Leiden, (1), 3:123, pl.7,fig.126 (in error spelled *ionkeri* in text and *jonkeri* in plate expl.); 1915 Tesch in Wanner, Palaeont.v.Timor 5:57, pl.81,figs.124a,b.
1934. *Nassa gruneri* Dunker, Mari, J.Conchyl. 78:60.
1966. *Niotha hispida* (A.Adams), Habe & Kosuge, Shells world col. 2:62,pl.22,fig.27.
1972. *Nassarius (Niotha) gruneri* (Dunker), Cernohorsky, Rec.Auckland Inst.Mus. 9:159, fig.78; 1978 Cernohorsky, Trop.Pacific mar.shells p.84,pl.26,fig.3.
1982. *Nassarius gruneri* (Dunker), Kaicher, Card cat.world-wide shells, Pack No.31: card 3168.

Shell up to 21.0 mm in length, elongate-ovate to ovate, solid, teleoconch of 5-6 whorls, protoconch eroded in all specimens examined; sculptured with numerous, regular, small pointed but non-spinose nodules which are arranged in 2-3 spiral rows on the penultimate and 8-10 rows on the body whorl. Axial ribs numerous, thin and close-set, numbering from 19-23 on the last two whorls, longitudinal interspaces between nodules concave, sutural nodules on body whorl frequently separated from remaining sculpture by a slightly wider, concave depression. Aperture moderately narrow, outer lip thickened and variced and denticulate within, columellar callus slightly spreading onto body whorl but irregularly bordered, columella denticulate, siphonal and anal canals distinct. Cream in colour, body whorl with 1-3 faint or distinct bluish-green or greenish-brown bands, columella and aperture cream, aperture sometimes light yellow and banded with purple-brown.

TYPE LOCALITY. Philippines *(gruneri)*; none *(acinosa)*; Loon, Bohol I, Philippines *(hispida)*; Soog, Indonesia *(fragum)*; Fatuh Lulih, Fialarang, Timor, Pliocene of Indonesia *(jonkeri)*.

DISTRIBUTION. From Indonesia to Japan, the Marianas and Solomon Is. In coral sand, intertidal and subtidal.

Type specimens. A probable syntype of *N.gruneri* (Dunker), is in the Dunker collection of the Zoological Museum, Humboldt University, Berlin, length 15.2 mm, width 10.1 mm. Two syntypes of *Nassa acinosa* Gould, are in the National Museum of Natural History, Washington, No.USNM-5725, and the adult syntype measuring length 16.3 mm, width 10.7 mm, is here selected as the lectotype (Pl.18,fig.2). Three syntypes of *N.hispida* A.Adams, are in the British Museum (N.H.), London, No.197341, and the syntype measuring length 20.0 mm, width 12.4 mm, is here designated as the lectotype (Pl.18,fig.3).

The holotype of *N.fragum* Rousseau, is in the Museum National d'Histoire Naturelle, Paris, length 19.1 mm, width 11.4 mm. The types of *N.jonkeri* K.Martin, are in the Rijksmuseum van Geologie en Mineralogie, Leiden.

Material examined. INDONESIA: Marudu Bay, N.Borneo (USNM); PHILIPPINES: Donsol, Luzon (coll.Powell); Siasi, Jolo; Cebu City, Cebu; Tataan, Bimaluc I: Balabac I; Papatag I, Tawi Tawi group; Dumurug Pt., Masbate; Bagatas I, off Luzon (all USNM); Jolo (SDMNH); Zamboanga, Luzon (LACM); Cebu (AMS); Punta Engano, Mactan I, Cebu (coll.Dan); near Siassi, Sulu (coll.Norton); JAPAN: Osima, Osumi (LACM; USNM); Nashima (LACM); MARIANAS IS: Guam I (SDMNH); SOLOMON IS: Lavvangu, Rennel I (ZMC).

Fossil record. PLIOCENE: Fatuh Lulih, Fialarang, Timor, Indonesia (K.Martin 1883 as *N.jonkeri)*; Kampong Fatoekau, Fialarang, Timor, Indonesia (Tesch in Wanner 1915).

Nassarius (Niotha) beberkirianus (Martin and Icke, 1906)
(Fig. 115)

1906. *Nassa (Uzita) beberkiriana* K. Martin & Icke, Samml.geol.Reichs-Mus. Leiden 1:317, pl.45,figs.734,734a; 1919 K.Martin, Palaeozool.Kenntn.Java p.84; 1921 Martin, Samml. geol.Reichs-Mus.Leiden, N.S., 1:461.

Shell conically-ovate, *c.* 8.0 mm in length, with 3 smooth embryonic whorls and 4 adult whorls which are separated by a canaliculate suture; in profile whorls appear almost straight. Sculptured with narrow, straight axial ribs which are bisected by 3 spiral cords in such a manner that they give rise to sharp nodules at the point of intersection. Penultimate whorl with 4 cords, fourth cord weak and visible near suture. The body whorl has the same type of nodulose sculpture all the way to the fasciole. Aperture ovate, slightly constricted, siphonal canal short and clearly differentiated. The columellar callus extends partly over the body whorl and is sharply bordered, anterior half of columella with 5-6 denticles, outer lip strongly variced and with 7 denticles within. The species has no close relatives in the Recent fauna. [free translation].

TYPE LOCALITY. Tji Beber kiri, near Njalindoeng, Java, Lower Miocene of Indonesia.

DISTRIBUTION. Lower to Upper Miocene of Java, Indonesia.

Type specimens. Two syntypes of *N.beberkirianus* (Martin & Icke), are in the Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9528, and the specimen measuring length 8.3 mm, width 4.8 mm, is here selected as the lectotype (Fig. 115).

Nassarius (Niotha) cinctellus (Gould, 1850)
(Plate 18, figs. 7-10)

1850. *Nassa cinctella* Gould, Proc.Boston Soc.Nat.Hist. 3:154; 1852 Gould, U.S. Expl.Exped. 12:259, pl.19,figs.327a,b; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:55.
1852. *Nassa geniculata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:100; 1854 Reeve, Conch.Icon. 8:pl.26,fig.171; 1934 Mari, J.Conchyl. 78:58.
1880. *Nassa parva* Marrat, Prop.new forms genus *Nassa* pp.55,83; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:37.
1978. *Nassarius (Niotha) cinctellus* (Gould), Cernohorsky, Trop.Pacific mar. shells p.84, pl.26,fig.2.

Shell up to 12.0 mm in length but frequently smaller, teleoconch of 5-5½ angulate whorls, protoconch of 3¼-3½ glassy-purple, finely carinate embryonic whorls; sculptured with strong, angulate axial ribs which continue to the back of the outer lip; spiral sculpture consists of numerous, close-set spiral cords which override axial ribs where they form small nodules, nodules sometimes bluntly echinate and arranged in 3 spiral rows on the body whorl, siphonal fasciole with oblique cords. Aperture narrow, outer lip thickened and variced, denticulate within, columellar callus narrow, laminate anteriorly, lower half of columella denticulate. White to cream in colour, protoconch and 1-2 post-embryonic whorls purple, later whorls with an interrupted narrow dark band against sutures, body whorl with a narrow or broad, brown to dark purple-brown central band, rarely with 2-3 bands, columella and aperture white. Operculum brown and serrate at margins.

TYPE LOCALITY. Pacific Ocean *(cinctellus)*; Ticao I, Philippines, 7 m *(geniculata)*; none *(parva)*. The Fiji Is, is here designated as the type locality.

DISTRIBUTION. From the Philippines to the Samoa and Tonga Is. In clean and weedy coral sand, in sand-pockets of reefs, within the intertidal region.

Type specimens. The holotype of *N.cinctellus* (Gould), is in the National Museum of Natural History, Washington, No.USNM-5723, length 8.3 mm, width 5.2 mm, and a paratype is in the Academy of Natural Sciences, Philadelphia, No.16294. Three syntypes of *Nassa geniculata* A.Adams, are in the British Museum (N.H.), London, No.197339, and the specimen measuring length 9.6 mm, width 5.9 mm, is here selected as the lectotype (Pl.18, fig.8). Three syntypes of *N.parva* Marrat, are in the Merseyside County Museum, Liverpool, and the specimen measuring length 5.3 mm, width 3.5 mm, is here designated as the lectotype (Pl.18, fig.9).

Material examined. PHILIPPINES: Cebu City, Cebu; Negros I (both USNM); Matabungkai, *c.* 115 km S.S.W. of Manila; Cawit, Marinduque; W. of Kawayan, Marinduque I (all AMS); PAPUA NEW GUINEA: Madang (coll.Bratcher); Nanga, E.New Britain (coll.Parkinson); SOLOMON IS: Marau Sound, Guadalcanal; Matui I, Marovo lagoon, New Georgia (both Auckland Univ.); Ugi I (USNM); reef at Aoki Harbour, Malaita I (AMS); Malu, N.Malaita I (coll.Parkinson); NEW HEBRIDES: Espiritu Santo I (coll.Coles); Tangoa I, S.Santo I (coll.Gardner); Port Havannah and Tuki Tuki Pt., both Efate I (coll.WOC); Aneityum I (coll.Richardson); SAMOA IS: Tutuila I (USNM); FIJI IS: Malevu reef, Mamanuca group; Yewalu reef, near Lautoka, W.Viti Levu; 6.4 km E. of Sigatoka, S.W.Viti Levu; W. of Rat Tail Passage, Suva reef (all coll.Marrow); Nananu-i-Ra I, N. off Viti Levu (coll.Bratcher); S. of Cave I, Suva Bay, 18°07'S & 178°23'E (ZMC); Lomalagi, S.Viti Levu (coll.Eker); Lami, S.Viti Levu (coll.McCausland); TONGA IS: Makahaa (LACM).

Tomlin (1940) correctly synonymised *N.parva* Marrat, with *N.geniculata* A.Adams (= *cinctellus* Gould), but incorrectly added *N.tabescens* Marrat to the synonymy of *N.cinctellus*. No locality has been given by Marrat for his *N.parva*, but the types are now labelled "Australia".

Nassarius (Niotha) nodulosus (Marrat, 1873)
(Plate 18, fig. 11; Plate 19, figs. 1-3)

1873. *Nassa nodulosa* Marrat, Ann.Mag.Nat.Hist. (4), 12:426; 1938 Tomlin, J.Conch. 21:83.
1898. *Nassa (Hebra) polychroma* Melvill, Ann.Mag.Nat.Hist. (7), 1:198, pl.12, fig.1.

Shell up to 16.0 mm in length, elongate-ovate to ovate, solid, teleoconch of 5-6 concavo-convex whorls, protoconch of 2¼-2½ embryonic whorls; sculptured with axial ribs which number from 12-13 on the penultimate and from 11-13 on the body whorl; spiral sculpture consists of spiral rows of generally large, roundly angulate nodes which are arranged in 2 rows on the penultimate and 4-5 rows on the body whorl, with additional spiral rows of minute pittings and occasional spiral threads; nodes at suture are smaller than subsequent rows and are separated by a prominently concave area. Aperture moderately narrow, outer lip thick and variced and with 6-8 strong denticles within, columellar callus thick but narrow and flatly angulate above parietal wall, columella with 5-7 denticles. Either uniformly orange in colour, some specimens greyish-orange and ornamented with purplish-orange or reddish spots on nodules, short bands on back of outer lip or occasionally a nebulous band at base, columella and aperture white.

TYPE LOCALITY. None *(nodulosus)*; Aden *(polychroma)*. Aden is here designated as the type locality.

DISTRIBUTION. From the Red Sea to Pakistan. Habitat unknown.

Type specimens. Four syntypes of *N.nodulosus* (Marrat), are in the Merseyside County Museum, Liverpool, and the uniformly orange syntype measuring length 15.4 mm, width 6.4 mm, is here selected as the lectotype (Pl.18,Fig.11). Three syntypes of *Nassa polychroma* Melvill, are in the British Museum (N.H.), London, (no number), and the slightly immature syntype which conforms to the type-figure, measuring length 16.0 mm, width 9.7 mm, is here selected as the lectotype (Pl.19,fig.2).

Material examined. RED SEA: Aden (BMNH); GULF OF OMAN: Masirah I (coll.Bosch); PAKISTAN: Karachi (AMS).

This appears to be a rare species since only a very few specimens have been seen in Museums.

Nassarius (Niotha) speciosus (A.Adams, 1852)
(Plate 19, figs. 4,5)

1846. *Buccinum plicosum* Dunker, Zeit.f.Malakozool. 3:111 (non Menke, 1830).
1852. *Nassa speciosa* A.Adams, Proc.Zool.Soc.Lond. Pt.19:100; 1853 Reeve, Conch.Icon. 8:pl.3, figs.16a,b; 1904 E.A.Smith, J.Malac. 11:23; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43; 1959 Barnard, Ann.Sth.Afric.Mus. 45:116, fig.22c (radula); 1973 Kensley, Sea-shells Sth.Africa p.162, fig.606.
1886. *Nassa plicosa* (Dunker), Sowerby, J.Conch. 5:4; 1936 Peile, Proc.Malac.Soc.Lond. 22:140 (mentions radula).
1907. *Phos plicosus* Dunker, Melvill & Standen, Trans.R.Soc.Edinburgh 46:154.
1915. *Alectrion plicosa* (Dunker), Bartsch, U.S.Nat.Mus.Bull. 91:52.
1928. *Nassarius plicosus* (Dunker), Tomlin, Ann.Sth.Afric.Mus. 24:324.
1982. *Nassarius speciosus* (A.Adams), Kaicher, Card cat.world-wide shells, Pack No.31: card 3216.

Shell up to 31.0 mm in length, elongate-ovate, some individuals broader than others, spire pointed, teleoconch of 7-7½ almost flat-sided whorls which are subangulate on presutural ramp, protoconch of 2¾-3 smooth embryonic whorls, sutures adpressed and occasionally wavy; sculptured with moderately slender axial ribs, ribs do not reach sutures on the last 2 whorls and also become obsolete on dorsal side of the body whorl and visible only as nodes at the shoulder; spiral sculpture consists of spiral grooves which produce numerous flattish spiral cords, sculpture distinctly granose on dorsal side of body whorl. Outer lip not greatly thickened, only slightly varicose, interior with a few weak, short denticles, columellar callus partly spreading onto body whorl, especially broad but frequently thinn-

ing above parietal wall, base of columella with up to 5 small denticles, siphonal notch and parietal denticle distinct. Cream to buff in colour, columellar callus and aperture porcellaneous-white, edge of outer lip with a few brown bars, base of outer lip and interior of siphonal canal frequently stained chocolate-brown. Operculum brown and simple at margins, but Barnard (1959) reports one specimen with crenulate margins. Periostracum opaque and brownish in colour.

TYPE LOCALITY. None *(speciosus)*; Cape of Good Hope, South Africa *(plicosum)*.

DISTRIBUTION. Confined to South Africa. In sand, from the intertidal zone to a depth of 183 m.

Type specimens. Three syntypes of *N.speciosus* (A.Adams), are in the British Museum (N.H.), London, No.1973129, and the specimen measuring length 29.8 mm, width 15.8 mm, is here selected as the lectotype (Pl.19,fig.4). Type specimens of *Buccinum plicosum* Dunker, are in the Zoological Museum, Humboldt University, Berlin.

Material examined. SOUTH AFRICA: W. of Cape Barracota, Agulhas Bank, 10-12 m; False Bay, 55 m; Chapman Bay, 51 m; Buffalo Bay, False Bay, 55 m (all ZMC); off Roman Rock, False Bay, 35 m (coll.Powell); Mossel Bay, 18 m (coll.Marrow); Simons Bay (SDMNH; USNM); Jeffrey's Bay (AMS, LACM); Durban, Natal; Port Alfred; Sebastian Bluff; Fishhoek Bay, False Bay (all USNM); Algoa Bay (AMS).

Fossil record. LATE TERTIARY: Saldanha Bay, South Africa (Barnard, 1959).

Barnard (1959) was correct in rejecting *Buccinum plicosum* Dunker, 1846, as a primary homonym of *B.plicosum* Menke, 1830, a taxon based on *B.niveum* Gmelin, 1791.

Bisacchi's (1930) report of *N.speciosus* from the Red Sea is most probably a misidentification. Kaicher (1982) states that the species is a shallow water inhabitant, however, *N.speciosus* is more often found subtidally, and Tomlin (1928) recorded the species from a depth of 183 m.

Nassarius (Niotha) pyramidalis (A.Adams, 1853)
(Plate 19, figs. 6-8)

1853. *Desmoulea pyramidalis* A.Adams, Proc.Zool.Soc.Lond. Pt.19:113; 1886 Sowerby, J.Conch. 5:4.
1854. *Nassa pyramidalis* A.Adams, Reeve, Conch.Icon. 8:pl.29,figs,191a,b; 1904 E.A.Smith, J.Malac. 11:23; 1959 Barnard, Ann.Sth.Afric.Mus.45:101; 1973 Kensley, Sea-shells South.Africa pl.162, fig.604.
1900. *Nassa filmerae* Sowerby, Proc.Malac.Soc.Lond. 4:2, pl.1,fig.5; 1903 E.A.Smith, Proc.Malac.Soc.Lond. 5:373.
1915. *Alectrion pyramidalis* Dunker, Bartsch, U.S.Nat.Mus.Bull. No.91:52.
1932. *Nassa pyramidalis affinis* Turton, Mar.shells Pt.Alfred p.59, pl.14, fig.436 (non J. de C.Sowerby, 1832).
1932. *Nassa pyramidalis punctilineata* Turton, Mar.shells Pt.Alfred p.59,pl.14, fig.437.
1933. *Nassa pyramidalis rufanensis* Turton, J.Conch. 19:370 (nom.subst.pro *N.pyramidalis affinis* Turton, 1932).

Shell up to 22.0 mm in length, elongate-ovate to pyramidal, body whorl globose, teleoconch of 5-5½ convex whorls, protoconch of 3 smooth, glassy embryonic whorls; post-embryonic whorls sculptured with moderately broad axial ribs which are either obsolete on last 2 whorls or continue to the ventral side of the body whorl and become obsolete on the dorsal side; spiral sculpture consists of numerous, crowded, impressed spiral striae which number about 8-10 on the penultimate and from 22-26 on the body whorl in addition to 6-7 cords on the siphonal fasciole; in some specimens spiral striae are visible only anterior to the suture and at the base of the body whorl and become obsolete on the central part of the body whorl. Aperture moderately wide, outer lip thick and variced in adult specimens, interior with up to 16 lirate denticles, columella calloused anteriorly and partly spreading in a thinner glaze on to body whorl, columella smooth except for an anterior and a parietal denticle, siphonal notch deep, anal canal distinct. Creamy-white to light orange-brown in colour, streaked with orange-brown, sutures frequently with irregular brown spots. Apical whorls occasionally brown, columella fawn or stained with brown, aperture brown. Operculum and radula unknown.

TYPE LOCALITY. None *(pyramidalis)*; Pondoland, Sth.Africa *(filmerae)*; Port Alfred, Sth.Africa *(affinis* Turton; *punctilineata*; *rufanensis)*. Sowerby (1886) first mentioned the correct locality of Port Elizabeth, Sth.Africa, and the latter is here designated as the type locality.

DISTRIBUTION. From Mossel Bay to Natal, Sth.Africa. Subtidal, to a depth of 240 m.

Type specimens. The holotype of *N.pyramidalis* (A.Adams) is in the British Museum (N.H.), London, No.1973160, length 21.3 mm, width 11.5 mm. The holotype of *Nassa filmerae* Sowerby, is in the same Institution No.1900.5.22.41, length 15.5 mm, width 9.3 mm. The type specimens of *N.affinis* Turton, *N.punctilineata* Turton and *N.rufanensis* Turton, are in the Oxford University Museum.

Material examined. SOUTH AFRICA: Natal (USNM); Algoa Bay (AMS; NZGS; SDMNH); Jeffrey's Bay (coll.Ackermann).

Literature records. SOUTH AFRICA: Port Elizabeth; Port Alfred; Jeffrey's Bay; mouth of Gouritz river; off Cape St.Blaize, 51 m; off Cove Rock, East London area, 146-238 m; off Umhloti river, Natal, 73 m; 30°47'S & 30°29'E, 44 m; Scottburgh, Natal (all Barnard 1959).

Barnard (1959) was correct in synonymising *Nassa filmerae* with *Nassarius pyramidalis*. The holotype of *N.pyramidalis* has been subsequently erroneously labelled "Japan".

Nassarius (Niotha) fidus (Reeve, 1853)
(Plate 19, fig.9)

1853. *Nassa fida* Reeve, Conch.Icon.8:pl.13, fig.88; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:94; 1934 Mari, J.Conchyl. 78:60.

Shell up to 14.0 mm in length, ovate, squat and solid, teleoconch of 5 whorls, protoconch unknown; sculptured with prominent round nodules which are arranged in axial and spiral rows, penultimate whorl with a row of nodules at sutures, followed by a concave area and 2 further rows of nodules posterior to subsequent suture, body whorl with a row of sutural nodules followed by a smooth concave area and 6-7 regular rows of nodules, siphonal fasciole slanting obliquely and with 2 strong cords and a few weaker ones. Aperture small, outer lip thick and variced, prominently thickened above anal canal, interior with 4-5 denticles, columellar with a prominent, rounded, well-bordered callus which is plicate along its entire length, siphonal notch and anal canal distinct. White in colour, sutural nodules yellowish, centre of body whorl with a dark green band, aperture banded with greenish-brown.

TYPE LOCALITY. None.

DISTRIBUTION. Unknown.

Type specimens. Two syntypes of *N.fidus* (Reeve), are in the British Museum (N.H.), London, No.197113, and the specimen measuring length 14.1 mm, width 9.0 mm, is here selected as the lectotype (pl.19, fig.9).

No other specimens of this species have been sighted, and when further material becomes available, the concept of this species may have to be revised. The species most closely resembles squat individuals of *N.gruneri* (Dunker).

Tomlin (1932b) erroneously associated *N.fidus* with *Nassa sistroidea* G. & H.Nevill, 1874, which is a variant of *Hebra subspinosa* (Lamarck).

Subgenus **Telasco** H. and A. Adams, 1853

Telasco H. & A.Adams, 1853, Gen.Rec.Moll. 1:119. Type species by SD (Bucquoy, Dautzenberg & Dollfus, 1882) *Nassa variabilis* (Philippi) = *Buccinum cuvierii* Payraudeau, 1826. Recent, Mediterranean.

1936. *Tarazeuxis* Iredale, Rec.Austral.Mus. 19:322. Type species by OD *Nassa mucronata* A.Adams, 1852 = *N.gaudiosa* Hinds, 1844. Recent, Indo-Pacific (nomen nudum).

Shell moderately small, up to 25.0 mm in length, early whorls sculptured with axial ribs and spiral striae but last whorl tending to be smooth, outer lip and columella denticulate.

Species of the subgenus *Telasco* are intermediate in shell-characters between *Niotha* and *Zeuxis*. The sculpture is less prominent, particularly on the body whorl, the columellar callus is less expanded than in *Niotha* and the columella is not regularly denticulate along its entire length as in *Zeuxis*. Laterals of the radula have 2 simple cusps and an accessory lateral plate is present.

Tarazeuxis Iredale, 1936, is considered to be a *nomen nudum*. Iredale's (1936) statement when referring to *Nassa mucronata* "it has been placed under *Zeuxis* but it does not correlate with *taenia* Gmelin, the type of *Zeuxis,*" could hardly be construed to be a statement purporting to give characters differentiating the taxon, as required under the provisions of Article 13(a)(i) of the Code of ICZN.

Bucquoy, Dautzenberg and Dollfus' designation (1882) antedates the one by Oostingh (1939). The authors designated *Buccinum costulatum* Brocchi,1814, as the type species of *Telasco*, but at the same time included *Nassa variabilis* Philippi, in synonymy. According to Article 69(a)(iv) of the Code of ICZN, *Nassa variabilis* Philippi, an originally included species, becomes the type species of *Telasco* H. & A.Adams. The subgenus contains 14 Recent and 2 fossil species from the tropical Indo-Pacific.

Nassarius (Telasco) gaudiosus (Hinds, 1844)
(Plate 19, figs.10-12)

1844. *Nassa gaudiosa* Hinds, Voy.H.M.S."Sulphur", Zool. p.36, pl.9,figs.16,17; 1853 Reeve, Conch.Icon. 8:pl.13, figs.85a,b; 1868 Pease, Americ.J.Conch. 4:107; 1903 E.A.Smith, Proc.Malac.Soc.Lond. 5:373; 1908 Hirase, Conch.Mag.Kyoto 2:pl.29, figs.82-84.

1852. *Nassa mucronata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:105; 1853 Reeve, Conch.Icon. 8:pl.2, fig.8; 1907 Couturier, J.Conchyl. 55:138.
1852. *Nassa lilacina* Gould, U.S.Expl.Exped. 12:265, pl.19,figs.331,331a; 1868 Pease, Americ.J.Conch. 4:107.
1853. *Buccinum (Nassa) semiplicatum* Dunker, Zeit.f.Malakozool. 10:59 (non O.Costa, 1829; nec. A.Adams, 1853).
1867. *Nassa semisulcata* Dunker, Novitates Conchol. p.96, pl.32,figs.5,6 (nom.subst.pro *Buccinum (Nassa) semiplicatum* Dunker, 1853) [non *Nassa semisulcata* Rousseau, 1854].
1877. *Nassa graphitera* Beck in Marrat, Prop.new forms genus *Nassa,* pl.1, fig.8 (non Rousseau, 1854).
1895. *Nassa (Alectryon) mucronata* A.Adams, Melvill & Standen, J.Conch. 8:107; 1898 Melvill & Standen, J.Conch. 9:41; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:411; 1955 Marche-Marchad, J.Conchyl. 95:36.
1895. *Nassa (Telasco) gaudiosa* (Hinds), Melvill & Standen, J.Conch. 8:107.
1910. *Alectrion gaudiosus* (Hinds), Iredale, Proc.Malac.Soc.Lond. 9:71.
1915. *Arcularia gaudiosus* (Hinds), Oliver, Trans.Proc.N.Z.Inst. 47:535.
1928. *Nassarius (Alectrion) mucronatus* A.Adams, Melvill, Proc.Malac.Soc.Lond. 18:106.
1929. *Nassa (Zeuxis) gaudiosa* (Hinds), Dautzenberg, Faune Colon.Franc. 3:410; 1933 Dautzenberg & Bouge, J.Conchyl. 77:212.
1952. *Nassarius gaudiosus* (Hinds), Morris, Field Guide shells Pacific & Hawaii p.191, pl.39,fig.14; 1967 Orr-Maes, Proc.Acad.Nat.Sci.Philadelphia 119:135, pl.13,fig.F;1975 Salvat & Rives, Coquill.Polynesie p.321,fig.231; 1977 Loch, Austral.Shell News No.20:3, textfig. (animal); 1979 Kay, Hawaiian Mar. shells p.273,fig.95B.
1952. *Alectrion pictus* (Dunker), Tinker, Pacific sea shells p.82, centre fig. (non *Buccinum pictum* Dunker, 1846).
1961. *Nassarius (Tarazeuxis) mucronatus* (A.Adams), McMichael & Rippingale, Queensld. & Gt.Barrier reef shells p.105, pl.13,fig.19.
1962. *Tarazeuxis mucronatus* (A.Adams), Iredale & McMichael, Austral.Mus.Mem. No.11:107.
1972. *Nassarius (Telasco) gaudiosus* (Hinds) *[pars]*, Cernohorsky, Rec.Auckland Inst.Mus. 9:161,figs.102 and 104 only.
1974. *Nassarius reeveanus* Dunker, Quirk & Wolfe, Seashells of Hawaii p.20, fig.5 (non *Buccinum reeveanum* Dunker, 1847).
1976 *Nassarius (Niotha) gaudiosus* (Hinds), Salisbury, Hawaiian Shell News 25(2):5, fig.4.

Shell up to 22.0 mm in length, elongate-ovate to ovate, light in weight, spire frequently concave, teleoconch of 5½-6½ convex whorls, protoconch of 3-3¼ glassy, depressed but strongly carinate embryonic whorls, penultimate whorl frequently inflated and slightly concave anterior to suture; sculptured with slender, angulate axial ribs which persist at least to the penultimate whorl, body whorl with usually short axial riblets only; spiral sculpture consists of 4-5 fine, overriding spiral threads on first 2-3 post-embryonic whorls, spiral sculpture becoming obsolete on later whorls apart from 3-4 basal cords and oblique cords on siphonal fasciole, siphonal and anal canals distinct. Aperture moderately narrow, outer lip thickened and finely denticulate-lirate within, columellar callus prominent anteriorly but only glazed above parietal wall, concave columella appearing smooth apart from 2 basal folds. Variable in colour, but usually white to cream, flecked, streaked or maculated with tan to dark brown, sutures and centre of body whorl occasionally with a darker interrupted brown band, and also ornamented with wide-spaced, orange-brown lines, which, even if faint, usually visible on the back of the outer lip; columellar callus and aperture white, deep interior of aperture sometimes with 2 brown bands, protoconch either white, fawn or lilac. Operculum yellowish-brown and usually with a dark brown streak through centre, margins serrate.

TYPE LOCALITY. Straits of Malacca, Indonesia *(gaudiosus)*; Dumaguete, Negros I, Philippines, 20 m *(mucronatus)*; Clermont Tonnére [= Reao Atoll, Tuamotu Archipelago] *(lilacina)*; none (*semiplicatum* Dunker and *semisulcata* Dunker); Hawaiian Is (*graphitera* Marrat).

DISTRIBUTION. From East Africa through the tropical Indo-Pacific to the Marquesas Is and Hawaiian Is. In clean coral sand, from the intertidal zone to a depth of 20 m.

Type specimens. Five syntypes of *N.gaudiosus* (Hinds), are in the British Museum (N.H.), London, No.1844.9.23.17., and the specimen measuring length 17.3 mm, width 8.3 mm, is here selected as the lectotype (pl.19, fig.10). Two syntypes of *Nassa mucronata* A.Adams, are in the same Institution, No.1973135, and the specimen measuring length 21.2 mm, width 10.8 mm, is here designated as the lectotype (pl.19, fig.11). The juvenile holotype of *N.lilacina* Gould, is in the National Museum of Natural History, Washington, No.USNM-5731, length 10.5 mm, width 5.3 mm. The type of *N.semiplicata* Dunker (= *N.semisulcata* Dunker) and of *N.graphitera* Marrat, have not been found, but the good type figures clearly associate the species with *N.gaudiosus*.

Material examined. SOUTH AFRICA: Park Rynie, 80 km S. of Durban, Natal (coll.Meyer); REUNION I: Lagon de la Saline (coll.Martin); MAURITIUS: (coll.Powell); INDONESIA: Straits of Malacca (BMNH); AUSTRALIA:

Winston I, Capricorn group, Qld. (coll.Boorman); Beaver reef, Qld. (AIM); Magnetic I, Qld. (coll.Carter); KERMADEC IS: Raoul I (coll.Gall); Denham Bay, Raoul I (NZGS); SOLOMON IS: Baga I, Vella Lavella I (coll.Voyce); NEW HEBRIDES: Aneityum I (coll.Richardson); Cook Beach, Tanna I (coll.Colardeau); Lolowai, Aoba I (coll.Gardner); LOYALTY IS: Lifu I (coll.Powell); FIJI IS: Moce I, Lau group (AIM); NAURU I: Meneng hotel, E.coast of Nauru (coll.McCausland); COOK IS: Rarotonga (AIM); LINE IS: Fanning I (coll.Powell); SOCIETY IS: Faaone, Tahiti (coll.Trondle); TUAMOTU ARCHIPELAGO: Moruroa Atoll (coll.Beslu); Anaa I (coll.Trondle); MARQUESAS IS: Bay N.W. of Tahuata I (coll.Bratcher); HAWAIIAN IS: Electric Beach, Oahu, 18 m (coll.Salisbury); Mahalapu, Kauai (coll.Haas); Keaukaha, Hilo (coll.Roberts); Niihau I (coll.Powell); Kapaa, Kauai; off Honolulu Harbour, Oahu; Keokea, Hilo; Lapakoehoe; Kapoho (all USNM); Keehi lagoon, Oahu (coll.Bratcher).

The species is usually confused with *N.reeveanus* (Dunker), but can be separated on features of more depressed, strongly carinate embryonic whorls, concave spire, inflated and axially ribbed penultimate whorl which is concave anterior to the sutures, finer denticles on the outer lip and a much lighter colouring and ornamentation.

The form *mucronata* A.Adams, has been based on a slightly broader individual, and the taxa *semiplicata* Dunker (= *semisulcata* Dunker) and *graphitera* Beck in Marrat, are the more slender form with short sutural axial ribs. The latter form occurs frequently in the Hawaiian and Kermadec Is.

Nassarius (Telasco) reeveanus (Dunker, 1847)
(Plate 20, figs.1-10)

1847. *Buccinum reeveanum* Dunker, Zeit.f.Malakozool. 4:62; 1849 Philippi, Abb.Beschr.Conchyl. 3:65, pl.2,fig.6.
1850. *? Buccinum (Bullia ?) velatum* Gould, Proc.Boston Soc.Nat.Hist. 3:151; 1852 Gould, U.S.Expl.Exped. 12:252, pl.19,figs.319,319a; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:165.
1852. *Nassa luctuosa* A.Adams, Proc.Zool.Soc.Lond. Pt.19:105; 1853 Reeve, Conch.Icon. 8:pl.16,fig.109; 1871 Lischke, Japan.Meeres-Conchyl. 2:51.
1852. *Nassa punctata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:105; 1853 Reeve, Conch.Icon. 8:pl.8, fig.54 (non *Buccinum punctatum* Kiener, 1834 = *Nassarius*).
1852. *Nassa lentiginosa* A.Adams, Proc.Zool.Soc.Lond. Pt.19:105; 1853 Reeve, Conch.Icon. 8:pl.3,fig.15; 1891 E.A.Smith, Proc.Zool.Soc.Lond. p.407; 1903 E.A.Smith, Proc.Malac.Soc.Lond. 5:373; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43.
1852. *Nassa zonalis* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107; 1853 Reeve, Conch.Icon. 8:pl.14, fig.93; 1906 Suter, Trans.Proc.N.Z.Inst. 38:331 (non *Buccinum zonale* Bruguière, 1789 = *Nassarius*).
1852. *Nassa filosa* "Gray MS", A.Adams, Proc.Zool.Soc.Lond. Pt.19:105 (publ. in synonymy of *Buccinum reeveanum* Dunker, 1847).
1853. *Nassa filosa* Reeve, Conch.Icon. 8:pl.6,figs.35a,b; 1903 E.A.Smith, Proc.Malac.Soc.Lond. 5:373.
1860. *Nassa mustelina* Gould, Proc.Boston Soc.Nat.Hist. 7:331; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:114; pl.16,fig.2 (figd. holotype).
1876. *Nassa marratii* E.A.Smith, J.Linn.Soc.Lond. 12:544, pl.30,fig.5; 1915 Preston, Rec.Indian Mus.Calcutta 11:290.
1877. *Nassa velata* Gould var. Marrat, Prop.new forms genus *Nassa*, pl.1,fig.9.
1880. *Nassa ferruginea* Marrat, Var.shells genus *Nassa*, p.78.
1887. *Nassa punctata* A.Ad., v.Martens, J.Linn.Soc.Lond. 21:182; 1931 van der Vlerk, Leidsche geol.Meded. 5:234.
1897. *Nassa (Zeuxis) marratii* Smith, Melvill & Sykes, Proc.Malac.Soc.Lond. 2:169; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:411.
1898. *Nassa (Zeuxis) lentiginosa* var. *punctata* A.Ad., Melvill & Sykes, Proc.Malac.Soc.Lond. 2:169.
1901. *Nassa (Zeuxis) filosa* Gray, Melvill & Standen, Proc.Zool.Soc.Lond. 2:411.
1928. *Nassarius (Zeuxis) lentiginosus* A.Adams, Melvill, Proc.Malac.Soc.Lond. 18:106.
1930. *Nassarius lentiginosus* (A.Adams), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:46.
1936. *Nassarius zonalis* (A.Adams), Hirase, Coll.Japan.shells ed.5:75, pl.10 6, fig.6.
1946. *Nassarius (Zeuxis) velatus* (Gould), Habe, Venus:Jap.J.Malac. 14:196, textfig.13 (radula); 1954 Kira, Col.Illust.shells Japan 1:56, pl.28,fig.20.
1954. *Nassarius (Zeuxis) zonalis* Kira, Col.Illust.shells Japan 1:56,pl.28,fig.20.
1957. *Nassarius pictus* (Dunker), Kaicher, Indo-Pacific Sea shells, pl.7,fig.18 (non *Buccinum pictum* Dunker, 1847 = *Nassarius*).
1962. *Zeuxis velatus* (Gould), Kira, Shells west.Pacific col. 1:81, pl.29, fig.24.
1967. *Zeuxis (Tarazeuxis) velatus* (Gould), Habe & Kosuge, Stand.book Jap.shells 3:75, pl.29,figs.26,27.
1971. *Tarazeuxis velatus* (Gould), Kuroda & Habe, Sea shells Sagami Bay, p.178, pl.48, figs.19,20.
1972. *Nassarius (Telasco) gaudiosus* (Hinds) *(pars)*, Cernohorsky, Rec.Auckland Inst.Mus. 9:161, figs. 100, 101, 103 only.
1974. *Nassarius (Telasco) velatus* (Gould), Cernohorsky, Venus: Jap.J.Malac. 33(2):61, fig.18 (figd. syntype).

Shell up to 26.0 mm in length, teleoconch of 5½-7 convex to almost flat-sided whorls, protoconch of 2¾-3¼ carinate embryonic whorls. Closely similar to *N.gaudiosus* (Hinds), it differs in the following features: the embryonic whorls are less prominently carinate and thus more convex, spire is regularly conical and not concave, first 2-3 post-embryonic whorls have more numerous and crisper spiral threads numbering from 8-10 (4-5 in *N.gaudiosus*), axial ribs start to become obsolete on the antepenultimate whorl and absent on the last 2 whorls and sutures become distinctly crenulate; although spiral sculpture usually becomes obsolete on the last 2-3 whorls, in some individuals spiral striae can be seen even on the body whorl, especially on the back of the outer lip which is more strongly variced; the denticles on the outer lip are usually coarser and the columellar callus thicker above the parietal wall. The colouring of *N.reeveanus* is considerably darker than in *N.gaudiosus*, numerous small white spots can be seen under the orange, brown to almost dark purple-brown top colour, sutures are frequently spotted with white, the varix is paler and orange-brown spiral lines encircle the shell; some individuals are uniformly orange while others are alternately banded with white and dark brown; the aperture is frequently purplish-brown and denticles white, columellar callus white but occasionally stained chocolate-brown or dark orange. The operculum is brown, serrate or jagged at margins, but one specimen has been seen with simple margins.

TYPE LOCALITY. ? East Indies *(reeveanus)*; Mindanao, Philippines *(velatum)*; Cagayan, Province of Misamis, Mindanao I, Philippines *(luctuosa)*; Puerto Galero, Albay, Luzon, Philippines (*punctata* A.Adams); Masbate, Philippines, 13 m *(lentiginosa)*; Ticao I, Philippines (*zonalis* A.Adams); Cagayan I, Mindanao, 46 m *(filosa)*; Ousima = Amami-O-Shima, Ryukyu Is, 4 m *(mustelina)*; San Christoval, Solomon Is *(marratii)*; none *(ferruginea)*; Bali, Indonesia, is here designated as the type locality.

DISTRIBUTION. From Reunion I to Japan and the Society Is. In clean and muddy sand, from the intertidal zone to a depth of 60 m.

Type specimens. The holotype of *N.reeveanus* (Dunker), is in the Zoological Museum, Humboldt University, Berlin, length 16.8 mm, width 9.8 mm. Two very worn syntypes of *Buccinum velatum* Gould, are in the National Museum of Natural History, Washington, No. USNM-18134, dimensions of illustrated syntype length 17.3 mm, width 8.0 mm (pl.20, fig.2). The following type specimens are in the British Museum (N.H.), London: two syntypes of *Nassa luctuosa* A.Adams, No.197348, and the specimen measuring length 16.5 mm, width 8.0 mm, is here selected as the lectotype (pl.20, fig.3); three syntypes of *N.punctata* A.Adams, No.1973136, and the specimen measuring length 22.6 mm, width 11.6 mm, is here designated as the lectotype (pl.20, fig.4). Three syntypes of *N.lentiginosa* A.Adams, No.197346, and the specimen measuring length 26.0 mm, width 13.3 mm, is here designated as the lectotype (pl.20, fig.5); three syntypes of *N.zonalis* AAdams, No.1973145, and the specimen measuring length 16.9 mm, width 9.2 mm, is here selected as the lectotype (pl.20, fig.6); two syntypes of *N.filosa* Reeve, No.1973115, and the specimen measuring length 21.0 mm, width 12.0 mm, is here designated as the lectotype (pl.20, fig.7); and the holotype of *N.marratii* E.A.Smith, No.1876.1.10.71, length 14.4 mm, width 6.8 mm. The holotype of *N.mustelina* Gould, is in the National Museum of Natural History, Washington, No.USNM-24200, length 10.6 mm, width 6.0 mm, and the holotype of *N.ferruginea* Marrat, is in the Merseyside County Museum, Liverpool, length 17.5 mm, width 9.0 mm.

Material examined. REUNION IS: Lagon de la Saline (coll.Martin); INDONESIA: Wisma Susi, N.end of Kupang, W.Timor; Sanur beach, Bali; Pantai Kelapata Lima, N. of Kupang, W. Timor (all coll.McCausland); PHILIPPINES: Mindanao, Zamboanga (coll.Dan); Guijulugan (USNM); Dungarree beach, Subic Bay (coll.Salisbury); Cebu (coll.Lumawig); Tubajon Bay, Dinagat, 10°20'N & 125°32'E (ZMC); CHINA: Stanley Bay, Hongkong; W. side of Tolo Channel, Hongkong (coll.Orr); RYUKYU IS: Bolo Pt. and Seragaki, both Okinawa I (coll.Deynzer); Nase, Okinawa (coll.Robertson); Nago, Okinawa; Onna Flat, S. Kunigami-Gun, Okinawa (both USNM); JAPAN: Hahajima, Ogasawara; Osima, Osumi (both USNM); Nada-Cho, Wakayama Pref., 9-18 m (coll.McCausland); PAPUA NEW GUINEA: Laing I, Hansa Bay, 45-60 m (coll.Tursch); Rabarua, E.New Britain (coll.Parkinson); Rabaul, New Britain (coll.Prior); AUSTRALIA: Western Australia: Coral Bay, between Carnarvon and Northwest Cape; near Yardie creek, S.W. Northwest Cape (both coll.Hansen); Port Hedland (coll.Powell); KERMADEC IS: Sunday I (AIM); SOLOMON IS: Russell I (coll.Potter); Bumana (coll.Powell); NEW HEBRIDES: Erakor reef, Efate I (coll.Bratcher); Lolowai, Aoba I (coll.Gardner); Teuma Bay, S.Efate I, 37-46 m (coll.Colardeau); Ambryn I (coll.Powell); Pango beach, Efate I (coll.Coles); LOYALTY IS: Lifu I (coll.Free); FIJI IS: Lami, Suva, S.Viti Levu (coll.McCausland); SAMOA IS: Apia (coll.Jackson); E.coast road, Apia (coll.Scott); SOCIETY IS: Arue, Tahiti; Faaone, Tahiti; Mahina, Tahiti (coll.Trondle); Baie de Matavai, Tahiti (coll.WOC).

The species occurs in a number of colour forms. The white and chocolate-brown banded form occurs in almost all populations throughout the species range, but the orange form is more common

in the Japanese faunal province. Some specimens from Tahiti are almost purple-black with a shining chocolate-brown columellar callus which may be streaked with orange.

Nassarius (Telasco) exulatus (E.A.Smith, 1911)
(Plate 20, fig.11)

1911. *Nassa exulata* E.A.Smith, Proc.Malac.Soc.Lond. 9:316, textfig.

"A slender form of *Nassa* with a small aperture and long spire. About three and a half of the upper whorls are prettily sculptured and then the ornamentation begins to die away, so that the last and penultimate whorls appear smooth to the naked eye, except a few striae around the lower part of the former. The colour-markings are pale brown, and consists on the penultimate whorl of two indistinct, rather interrupted zones, one below the upper suture and the other above the lower suture. These two bands are continued on the body-whorl, and there is a third around the base. As in many species, the upper margin on the whorls is somewhat distinctly marked off". (Original English description).

TYPE LOCALITY. Off Margaret Beaches, Christmas I, Indian Ocean, 183 m.

DISTRIBUTION. Unknown.

Type specimens. The holotype of *N.exulatus* (E.A.Smith), is in the British Museum (N.H.), London, No.1911.2.26.12.1, length 13.1 mm, width 5.5 mm. The early whorls are axially ribbed and the last 3 smooth apart from 2 sutural cords, and the columella has 3 small denticles anteriorly and a parietal fold; the type is faded and worn and the brown bands cited by the author are barely visible.

The species has not been recognised since the date of description. The label bears the remark "= *marrati* Smith", which would make it *N.reeveanus* (Dunker). Since it does not quite conform to the diagnosis of *N.reeveanus*, it is here listed as a tentatively accepted species pending availability of more material and further information.

Nassarius (Telasco) limnaeiformis (Dunker, 1847)
(Plate 20, figs. 12-15)

1847. *Buccinum limnaeiforme* Dunker, Zeit.f.Malakozool. 4:64.
1850. *Nassa musiva* Gould, Proc.Boston Soc.Nat.Hist. 3:153; 1852 Gould, U.S.Expl.Exped. 12:256, pl.19,figs.234,234a; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:113 (non *Buccinum musivum* Brocchi, 1814 = *Nassarius*).
1853. *Nassa (Buccinum) coturnix* Dunker, Zeit.f.Malakozool. 10:59; 1867 Dunker, Novitates Conch. pl.32, figs.7,8.
1961. *Tarazeuxis reeveanus* (Dunker), Habe, Col.Illust.shells Japan 2:64, pl.32, fig.19; (non *Buccinum reeveanum* Dunker, 1847 = *Nassarius*).
1972. *Nassarius (Telasco) luridus* (Gould) *(pars)*, Cernohorsky, Rec.Auckland Inst.Mus. 9:163, fig.106 only (non *Nassa lurida* Gould, 1850).

Shell up to 23.0 mm in length, elongate-ovate, smooth and shining, solid, teleoconch of 5½-6¼ convex, inflated whorls, protoconch of 3 glassy embryonic whorls, last whorl finely carinate, sutures narrowly ledged; first three post-embryonic whorls sculptured with axial riblets and bisecting spiral threads which render ribs finely granulose, last 3 whorls completely smooth apart from 5-6 flattish axial ribs on the back of the outer lip and 2-3 obsolete spiral grooves on the base of the body whorl. Aperture moderately narrow, outer lip thickened but not variced, interior prominently lirate, lirae extending about half-way into the aperture, columellar callus prominent anteriorly and often as broad as the siphonal fasciole but usually only glazed or thinning above the parietal wall, columella regularly concave and distinctly denticulate along its entire length, siphonal and anal canals prominent, base of shell with 3-4 spiral cords. Brown to greenish-brown in colour, thickly ornamented with small and very irregular white spots which are usually larger at sutures, distinct encircling orange-brown spiral lines and occasionally a very narrow central band of white and dark brown spots on the body whorl; columellar callus white, interior of aperture purplish-brown, lirae pale in colour. Operculum brown, margins simple or with only 1 small denticle on either side.

TYPE LOCALITY. None *(limnaeiformis)*; Cape Verde Is = error! (*musiva* Gould); Manila, Philippines *(coturnix)*.

DISTRIBUTION. From Pakistan to South Africa, Japan and Samoa Is. In clean coral or muddy sand, intertidal.

Type specimens. A probable syntype of *N.limnaeiformis* (Dunker), from Dunker's collection is in the Zoological Museum, Humboldt University, Berlin, length 17.7 mm, and the immature holotype of *Buccinum coturnix* Dunker, is in the same Institution, length 17.5 mm. A syntype of *Nassa musiva* Gould, is in the National Museum of Natural History, Washington, No.USNM-5720, length 15.0 mm,

width 9.0 mm, and this specimen is here designated as the lectotype (pl.20, fig.14). Another paralectotype of *N.musiva* is in the Museum of Comparative Zoology, Harvard.

Material examined. PAKISTAN: Karachi (AMS); SOUTH AFRICA: Durban Bay, Natal (SDMNH); MALAYSIA: N.W. St.John's I (USNM); INDONESIA: W.coast of Gomomu I, S. of Obi I (WAM); Sanur beach, Bali; Pantai Kelapa Lima, 5 km N. of Kupang, W.Timor (both coll.McCausland); PHILIPPINES: Camiguin I; W. of Tara I; Malampaya Sound, Palawan group; Jolo I; E. side of Jagbolaran Str., Bohol; Masbate; Dumurug Pt., Masbate (all USNM); Lobo beach, Batangas, Luzon (AMS); E. of Puerto Princesa, Sulu Sea (coll.Richardson); RYUKYU IS: Bolo Pt. and Seragaki, both Okinawa I (coll.Deynzer); N. of Futsuki; Onna Flats, Sth.Kunigami-Gun; Okinawa Shima, all Okinawa I (all USNM); Machinato reef, Okinawa (Natal Mus.); JAPAN: Kikai, Osumi (USNM); WEST IRIAN: near Hollandia (USNM); Middleburgh I (AMS); PAPUA NEW GUINEA: near Gomododo, Milne Bay (USNM); Taurama, S.E. of Port Moresby; Ela Beach, Port Moresby (both AMS); Rabarua, E.New Britain (coll.Parkinson); AUSTRALIA: Green I, off Cairns, N.Qld. (coll.WOC); NEW HEBRIDES: Surunda, Espiritu Santo (coll.Coles); NEW CALEDONIA: Baie des Citrons, Noumea (coll.Coles); Ile St.Marie, Noumea (AMS); Baie de Mondoure, Noumea (coll.Reverce); Ile Art (coll.Tourres); FIJI IS: Lakeba and Moce Is, Lau group (AIM); Lami, Suva, S.Viti Levu (coll.McCausland); Korolevu, S.Viti Levu (AMS); Manava I, N. off Viti Levu (coll.WOC); Outrigger motel beach, Suva (coll.Richardson); SAMOA IS: Apia (coll.Jackson).

N.limnaeiformis differs from *N.gaudiosus* (Hinds) in not having a concave spire, having more inflated whorls which lack sculpture on the last 3 whorls, and the regularly lirate aperture and colour ornamentation. From *N.reeveanus* the species differs in its shiny, smooth appearance, more inflated whorls and absence of sutural crenulations which are present in almost all specimens of *N.reeveanus*, and a different colour pattern. *N.limnaeiformis* differs from both these species in its prominently denticulate or wrinkled columella. In its somewhat inflated form *N.limnaeiformis* could be confused with *N.luridus* (Gould), but the latter lacks the orange-brown spiral lines of the former.

Nassarius (Telasco) marmoreus (A.Adams, 1852)
(Plate 21, figs. 1,2)

1852. *Nassa marmorea* A.Adams, Proc.Zool.Soc.Lond. Pt.19:106.
1901. *Nassa (Zeuxis) picta* var. *marmorea* A.Adams, Melvill & Standen, Proc.Zool.Soc.Lond. 2:411.
1982. *Nassarius gaudiosus* (Hinds), D. & E. Bosch, Seashells of Oman p.105, upper figs. (non *Nassa gaudiosa* Hinds, 1844).

Shell up to 30.0 mm in length, elongate-ovate, solid, teleoconch of 5½-6¼ convex whorls, protoconch of 1½-1¾ smooth, non-carinate embryonic whorls; post-embryonic whorls sculptured with axial ribs and overriding spiral striae, sculpture gradually fading anteriorly, last whorl smooth apart from 5-6 basal cords and 5-6 cords on the siphonal fasciole; spire whorls occasionally with a shallow presutural groove. Aperture narrow, outer lip thickened and moderately variced interior with 8-12 lirate denticles, columellar callus narrow and bordered, columella with 2-10 denticles, siphonal canal distinct, anal canal deep and wedge-shaped. Variable in colour, generally finely marbled with greyish-brown to dark brown on a white to pale violet background, sutures occasionally with small dark brown spots, columella and edge of outer lip white to bluish-white, interior broadly banded with purple-brown. Periostracum thin, brown and moderately opaque. Operculum brown and irregularly serrate at margins.

TYPE LOCALITY. Cagayan, Mindanao, Philippines, 46 m = ? error.

DISTRIBUTION. From the Persian Gulf to Pakistan. From the intertidal zone to a depth of 46 m.

Type specimens. Two syntypes of *N.marmoreus* (A.Adams) are in the British Museum (N.H.), London, No.1973138, and the specimen measuring length 27.7 mm, width 14.7 mm, is here selected as the lectotype (pl.21, fig.1).

Material examined. GULF OF OMAN: Mina Al Fahal, near Muscat (coll.Bosch); Masirah I (coll.Bosch; coll Luther); PAKISTAN: Manova I, Karachi, (coll.Steiner).

The species is similar to *N.reeveanus* (Dunker), but is easily separated from this species by the paucispiral protoconch of 1½-1¾ non-carinate whorls (2¾-3¼ carinate whorls in *N.reeveanus*), a well-bordered, narrow columellar callus, and the lack of greenish-brown spiral lines which are such a conspicuous ornamentation in both *N.reeveanus* and *N.gaudiosus*, and always visible at least on the back of the outer lip.

Nassarius (Telasco) sufflatus (Gould, 1860)
(Plate 21, figs.3-6)

1846. *Buccinum pictum* Dunker, Zeit.f.Malakozool. 3:172; 1849 Philippi, Abb.Beschr.Conchyl. 3:65, pl.2,fig.6 (permanently rejected as a homonym prior to 1961 – see Amended Code of ICZN. Art. 59(b)(i) – rejected Tomlin, 1932).

1853. *Desmoulea japonica* A.Adams, Proc.Zool.Soc.Lond. Pt.19:113 (non *Nassa japonica* A. Adams, 1852 = *Nassarius*).
1854. *Nassa japonica* A.Adams, Reeve, Conch.Icon, 8:pl.29, fig.192 (non A.Adams, 1852).
1860. *Nassa sufflata* Gould, Proc.Boston Soc.Nat.Hist. 7:330; 1895 Pilsbry, Cat.mar.Moll.Japan p34; 1934 Mari, J.Conchyl. 78:8; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:155.
1868. *Nassa japonica* Lischke, Malakozool.Blaetter 15:220 (non A.Adams, 1852).
1869. *Nassa balteata* Lischke, Malakozool.Blaetter 16:107 (nom. subst. pro *N.japonica* Lischke, 1868) [publ. May 1869]; 1869 Lischke, Japan.Meeres-Conchyl. 1:61, pl.5,figs.10,11; 1882 Dunker, Ind.Moll.mar.Japonici, p.34 (non *Nassa balteata* Pease, 1869 – publ. 7 October 1869).
1870. *Nassa mutabilis* A.Adams, Ann.Mag.Nat.Hist. (4), 5:425 (non *Buccinum mutabile* Linnaeus, 1758 = *Nassarius*).
1882. *Nassa tenuis* E.A.Smith, Tryon, Man.Conch. 4:23, pl.7,figs.4,5 (non E.A. Smith, 1879).
1895. *Nassa binominata* Pilsbry, Cat.mar.Moll.Japan p.37 (nom. subst. pro *Desmoulea japonica* A.Adams, 1853).
1908. *Nassa picta* Dunker, Hirase, Conch.Mag.Kyoto 2:pl.29, figs.85,86.
1932. *Demoulia kurodai* Tomlin, Proc.Malac.Soc.Lond. 20:43 (nom. subst. pro *Desmoulea japonica* A.Adams, 1853) [non *Nassarius kurodai* Makiyama, 1927 = *Nassarius*].
1932. *Nassarius balteatus* (Lischke), Kanamaru, Venus:Jap.J.Malac. 3:280, textfig. 60; 1936 Hirase, Coll.Jap.shells ed.5:75, pl.106,fig.4.
1946. *Nassarius (Alectrion) balteatus* (Lischke), Habe, Venus:Jap.J.Malac.14:196, textfig.21 (radula); 1954 Kira, Col.Illust.shells Japan 1:56, pl.28,fig.22.
1960. *Nassarius (Zeuxis) subbalteatus* MacNeil, U.S.Geol.Surv.Prof.Pap. No.339:82, pl.8,fig.22.
1960. *Tarazeuxis sufflata* (Gould), Azuma, Cat.Moll.Shikoku, Japan p.42; 1960 Habe, Venus:Jap.J.Malac. 21:17; 1973 Habe, Ann.Repts.Noto Mar.Lab. 13:21.
1962. *Alectrion sufflatus* (Gould), Kira, Shells west.Pacific col. 1:81, pl.29, fig.22.
1967. *Zeuxis (Tarazeuxis) sufflatus* (Gould), Habe & Kosuge, Stand. book Jap. shells col. p.76, pl.29, fig.39.
1971. *Tarazeuxis sufflatus* (Gould), Kuroda & Habe, Sea shells Sagami Bay, p.179, pl.48, figs.13,14.
1974. *Nassarius (Telasco) sufflatus* (Gould), Cernohorsky, Venus:Jap.J.Malac. 33:60, textfig.17 (figd. holotype of *Desmoulea japonica* A.Adams, 1853); 1978 Cernohorsky, Trop.Pacific mar.shells p.86, pl.26, fig.7.

Shell up to 29.0 mm in length, inflated, light in weight for its size, shining, teleoconch of 5½-6¼ convex whorls, protoconch of 3-3¼ convex purple embryonic whorls, last whorl finely carinate; first 3 post-embryonic whorls sculptured with axial ribs and 4-5 finely incised spiral striae, last 3 whorls almost smooth apart from a few obsolete spirals and obsolete, irregularly wrinkled sutures, base of body whorl either smooth or with 1-3 almost obsolete cords, siphonal fasciole lacking spiral cords, 1 sharp keeled cord interposed between body whorl and siphonal fasciole. Aperture moderately wide, outer lip only slightly thickened, interior with up to 20 short lirae, edge of outer lip either simple or with small spinose denticles, columellar callus distinct on anterior half of columella but thinning and glazed above parietal wall, columella concave, anterior part with 1-4 denticles but remainder smooth, siphonal notch and anal canal prominent. Base colour brown, back of outer lip paler, densely ornamented with small, irregular white spots, sutures usually with purplish-brown spots, body whorl sometimes with a narrow spiral band of alternating white and brown spots, orange-brown spiral lines encircle last 2 whorls, protoconch and 1-2 post embryonic whorls purple, aperture and columellar callus white, back of siphonal canal purplish-brown on the rim. The only operculum seen was brown with simple margins.

TYPE LOCALITY. Hongkong, China and Kagoshima, Japan *(sufflatus)*; ? East Indies (*pictum* Dunker); Japan (*japonica* A.Adams, 1853; *binominata; kurodai*); Nagasaki, Japan (*japonica* Lischke; *balteata*); Shinzato tuff, Okinawa, Mio/Pliocene of Ryukyu Is *(subbalteatus)*. The type locality is here restricted to Japan.

DISTRIBUTION. From Natal, South Africa to Japan and N.W. Australia. In sand, from the intertidal zone to a depth of 20 m.

Type specimens. The type of *N.sufflatus* (Gould), has been lost or destroyed, and although the original description identifies the species, a neotype must be selected in the interest of nomenclatural stability. A specimen from Fukura, Awaji, Japan, is in the collection of the National Museum of Natural History, Washington, No. USNM-343059, length 21.7 mm, width 12.9 mm, is here selected as the neotype of *N.sufflatus* (Gould) [pl.21, fig.4]. A probable syntype of *Buccinum pictum* Dunker, is in Dunker's collection in the Zoological Museum, Humboldt University, Berlin, length 18.0 mm, width 10.5 mm. The holotype of *Desmoulea japonica* A.Adams (also type of *Nassa binominata* Pilsbry and *Demoulia kurodai* Tomlin, is in the British Museum (N.H.), London, No.197342, length 23.0 mm, width 15.5 mm. The holotype of *Nassarius subbalteatus* MacNeil, is in the National Museum of Natural History, Washington, No. USNM-562830, length 16.2 mm, width 10.4 mm. The type of *Nassa balteata* Lischke (also type of *N.japonica* Lischke), has not been found.

Material examined. SOUTH AFRICA: Chaka Rock, Natal, 29°30'S & 31°14'E (AMS); Reunion Rocks, Durban, Natal (coll.Meyer); MADAGASCAR: Tulear (SMOM); INDONESIA: Pantai Kelapa Lima, 5 km N. of Kupang, W.Timor (coll.McCausland); PHILIPPINES: Cebu I (coll.Lumawig); TAIWAN: (coll.Allo); JAPAN: Kusui, 9 m (coll.Eker); Nada, Wakayama Prefecture, Honshu, *c.* 10 m (NSMT); Fukura, Awaji; Wakanura, Kishiu (both USNM); Shimotsu; Awaji (both LACM); Kii (SDMNH; USNM); WEST IRIAN: Middleburgh I (coll.AMS); AUSTRALIA: Western Australia: Turtle beach, W. side of Northwest Cape (AMS); Between Cape Dupuy and Cape Malouet, Barrow I; Coral Bay; Horrock's Beach, N.of Geraldton; Yardie Creek, S.W. side of Northwest Cape (all coll.Hansen).

The species has had a complicated taxonomic history. The oldest name for the species under discussion is *Buccinum pictum* Dunker, 1846, however, Tomlin (1932b) rejected this name as a primary homonym of *B.pictum* Fleming, 1828. Although not strictly a homonym (just a generic re-assignment of *Purpura picta* Turton, 1825, to *Buccinum*), Dunker's *B.pictum* remains permanently rejected as a homonym according to the amended Article 59(b)(i) of the Code of ICZN. *Desmoulea japonica* A.Adams, 1853 proved to be a secondary homonym of *Nassa japonica* A.Adams, 1852, and the substitute names of *binominata* Pilsbry, and *kurodai* Tomlin, proved both superfluous and the latter even homonymous. The holotype of *"Desmoulea japonica* A.Adams" is so badly worn that it has been mistaken for a species of *Demoulia*. The next proposed name of *Nassa japonica* Lischke, 1868, is a primary homonym of *N.japonica* A.Adams, 1852, and was replaced with *N.balteatus* Lischke, 1869. The species has also been mistaken for the Mediterranean *Nassarius mutabilis* (Linnaeus), and has been erroneously synonymised with *N.tenuis* (E.A.Smith). The epithet *N.balteatus* (Lischke) has been used till about 1952, but in the last 30 years *N.sufflatus* (Gould) has been accepted as the valid name for the species.

Johnson (1964) during the course of his study on Gould's types, tried to trace type-specimens in several American Institutions. From the 374 new species described by Gould from the North Pacific Exploring Expedition, 102 have not been located by Johnson, and my own search for some of Gould's types has been equally as unsuccessful. It is therefore presumed that some of these types have been either destroyed in the 1871 fire in the Chicago Academy of Sciences or have become lost during the last 100 years of the collection's history. Since the taxon *N.sufflatus* (Gould), could be mistaken with some closely allied Indo-Pacific *Telasco* species, it was thought advisable to designate a neotype from the type-locality of Japan, in order to preserve taxonomic stability, and to prevent a different interpretation of the species at some future date. *Nassa balteata* Lischke, 1869, which has 4 months chronological priority over *N.balteata* Pease, 1869, could not be utilised for the species since no type is known to exist either.

The species is probably closest to *N.reeveanus* (Dunker), but differs from this species in having convexly rounded and not strongly carinate purple embryonic whorls, prominently inflated main whorls, non-crenulate sutures, shining appearance, almost non-existent basal cords and no oblique cords on the siphonal fasciole at all.

N.sufflatus has long been thought to be confined to the Japanese faunal region, but a recent study of specimens has shown the species to have a considerably wider distribution than originally presumed.

Nassarius (Telasco) luridus (Gould, 1850)
(Plate 21, figs.7-9)

1850. *Nassa lurida* Gould, Proc.Boston Soc.Nat.Hist. 3:153; 1852 Gould, U.S. Expl.Exped. 12:257, pl.19,figs.325,325a,b; 1868 Pease, Americ.J.Conch. 4:107; 1877 Brazier, Proc.Linn.Soc.N.S.W. 1:178; 1879 E.A.Smith, Proc.Zool.Soc.Lond. p.808; 1934 Mari, J.Conchyl. 78:7; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:106.
1852. *Nassa dispar* A.Adams, Proc.Zool.Soc.Lond. Pt.19:96; 1853 Reeve, Conch.Icon. 8:pl.7, fig.45; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:42.
1854. *Nassa graphitera* Rousseau, Voy.Pole Sud., Zool.5:80, pl.21,figs.28,29; 1890 Fischer & Crosse, J.Conchyl. 38:16.
1895. *Nassa (Telasco) dispar* A.Adams, Melvill & Standen, J.Conch. 8:107.
1898. *Nassa (Zeuxis) lurida* Gould, Melvill & Sykes, Proc.Malac.Soc.Lond. 3:38.
1911. *Nassa (Zeuxis) lucida (sic)* Gould, Schepman, Siboga-Exped. 49d:321.
1955. *Nassa (Alectryon) lurida* Gould, Marche-Marchad, J.Conchyl. 95:35.
1957. *Nassarius kieneri* Anton, Kaicher, Indo-Pacific Seashells pl.7,fig.24 (non *Buccinum kieneri* Anton, 1838 = unknown *Nassarius* spec.).

1972. *Nassarius luridus* (Gould), Cernohorsky, Rec.Auckland Inst.Mus. 9:163, fig.98 (radula), figs.105,107 only (shell); 1982 Kaicher, Card cat. world-wide shells, Pack No.31:card 3174.
1978. *Nassarius (Telasco) luridus* (Gould), Cernohorsky, Trop.Pacific mar.shells, p.86, pl.26,fig.8.

Shell up to 26.0 mm in length, solid, elongate-ovate, teleoconch of 5-6½ convex whorls which are subangulate at sutures, protoconch of 2½-3 glassy, finely carinate embryonic whorls; sculptured with broad axial ribs which become obsolete on the last 1-2 whorls apart from 4-5 crowded ribs on the back of the outer lip, body whorl suture either smooth or nodose; spiral sculpture consists usually of only a weak subsutural groove on spire whorls, spiral sculpture absent on last 1-2 whorls apart from 3-4 strong spiral cords at base, another angulate cord in the depression and 4-5 oblique cords on the siphonal fasciole. Aperture moderately wide, outer lip thickened, interior prominently lirate, columellar callus narrow, laminate anteriorly, columella with prominent denticles or wrinkles along its entire length in mature specimens. Base colour greenish-grey, ornamented with irregular, small white spots, bars or blotches, back of outer lip creamy-white, sutures sometimes with dark brown spots, columellar callus and edge of aperture white, interior of aperture greenish-brown, lirae paler, orange-brown spiral lines absent. Operculum brown, distinctly serrate or only jagged at margins.

TYPE LOCALITY. Tutuila, Samoa Is *(luridus)*; Philippines *(dispar)*; Vavao, Samoa Is *(graphitera)*.

DISTRIBUTION. From Pakistan to Mauritius, Philippines and the Samoa Is. In weedy and muddy sand, intertidal.

Type specimens. The holotype of *N.luridus* (Gould), is in the National Museum of Natural History, Washington, No. USNM-5721, length 19.0 mm, width 10.5 mm. Three syntypes of *Nassa dispar* A.Adams, are in the British Museum (N.H.), London (no number), and the syntype measuring length 24.4 mm, width 14.5 mm, is here selected as the lectotype (pl.21, fig.8). Types of *N.graphitera* Rousseau, are in the Museum National d'Histoire Naturelle, Paris.

Material examined. PAKISTAN: Karachi (AMS); INDIA: Goa (USNM); MAURITIUS: (LACM); ANDAMAN IS: (ZSI; ZMC); NICOBAR IS: Nancowry I (ZMC); THAILAND: Nai Yang, Phuket; Ko Surin I (both PMBC); INDONESIA: Tg Sawatelu, E. of Tg Morela, Ambon I (WAM); Pasir Putih near Panjang, E. of Tanjung, Karang, Sumatra; Carita beach, N.of Labuan, W.Java; Kupang, W.Timor; Pantai Kelapa Lima, W.Timor; Sanur beach, Bali; Nusa Tranggana, Timor; Palu Donggala, Central Sulawesi; Daeo, S.coast of Morotai, Malaka; Kalahabi Harbour, Alor I, N.of Timor (all coll.McCausland); Pulau Siburu, S.W.Sumatra; Marudu Bay, Borneo (both USNM); PHILIPPINES: Cebu (ZMC); Donpe (AIM); Boac I, Marinduque (coll.Powell); Puerto Galera, Mindanao; Zamboanga, Mindanao (both ZMC); Subic Bay, Dungaree Beach (coll.Salisbury); Donsol, Sorsogon, Luzon; Matabungkai, *c.*115 km S.S.W. of Manila (both AMS); near Cebu City; E.coast of Polilo; Bagaong, Mindoro; Cabuago, Catandianes; Negros I (all USNM); MARIANAS IS: Guam I (coll.Salisbury); WEST IRIAN: Japen I, Schouten Is (AMS); PAPUA NEW GUINEA: Port Moresby (AMS; USNM; ZMC); Mongop near Kavieng, New Ireland; Nui I, Madang Harbour; Hermit group (all AMS); Laing I, Hansa Bay (coll. Tursch); Rabaul, New Britain (coll.Prior); Rabarua, E.New Britain (coll.Parkinson); AUSTRALIA: Queensland: Daydream I, Whitsunday group; Point Pallarenda near Townsville; Horseshoe Bay, Magnetic I; Calindra; Four Mile Beach, Port Douglas; Kurrimine Beach; Lucinda Pt. (all coll.Powell); Yorkey's Knob, N.of Cairns; Langford reef (both AIM); Cooya Beach, N. of Cairns; Yeppoon (both coll.Gardner); Yule Pt., N.of Cairns; Lizard I; Double I, N. of Cairns; Townsville; Hook I, Whitsunday Passage; Bowen; Brampton I; Port Douglas; off Dunwich, Moreton Bay; Long I, Gt.Barrier reef; Low Isles; Dingo Beach; South Mission Beach; S. of Innisfail; Lindeman I, Whitsunday Passage; Proserpine; Green I near Cairns; Great Palm I; Brampton I; Michaelmas Cay; Seaforth, Mackay; Somerset Bay, Cape York Peninsula (all AMS); Western Australia: Port Hedland (coll. Powell); SOLOMON IS: Marau Sound; Gaskell; Paruru, all Guadalcanal (all Auckland Univ.); Lunga, Guadalcanal (USNM); NEW HEBRIDES: Port Havannah, Efate I (coll.Eker); Espiritu Santo (coll.Coles); Lelepa, Efate I (coll.Bratcher); NEW CALEDONIA: Touho Bay (AIM); Anse Vata, Noumea; Poindimie; Tuoarau (all AMS); FIJI IS: Suva reef, S.Viti Levu; Caboni beach, N.E. Viti Levu (coll.Eker); Lami, Suva; W.of Rat Tail Passage, Suva reef; Malevu reef, Mamanuca group (all coll.Marrow); S. of Cave I, Suva Bay; 12-15 km E. of Bau I, S.Viti Levu (both ZMC); Vatia wharf, N.W. Viti Levu (coll.Bratcher); Korotogo, S.Viti Levu; Lautoka, W.Viti Levu; Nadi Bay (all AMS); Suva Pt., S.Viti Levu (USNM); Yanuca Pt., Nananu-i-Ra I, N. off Viti Levu (coll.Bratcher); Leleuvia I near Ovalau I (coll.Dickinson); SAMOA IS: Watson's I (AIM); Pago Pago (ZMC); near Apia (coll.Taylor); Tutuila (USNM); Vaiala, Apia (coll.Scott).

The species is common in the tropical Indo-Pacific and usually occurs in large colonies. It is easily distinguished from its nearest relatives by the absence of the orange-brown spiral lines.

Nassarius (Telasco) albomaculatus Rehder, 1980
(Plate 21, figs.10,11)

1980. *Nassarius (Telasco) albomaculatus* Rehder, Smithsonian Contrib.Zool. No.289:82, pl.10, figs.4,5.

Shell up to 17.0 mm in length, ovate-acuminate, moderately solid, teleoconch of 5¼-5½ distinctly convex whorls, protoconch of 3½-4 smooth, embryonic whorls, last whorl finely carinate; sculptured with broad axial ribs which persist to the penultimate whorl but become obsolete on the body whorl where they are only faintly indicated anteriorly to the subsutural band of nodules; spiral sculpture consists of *c.* 3 overriding spiral threads on upper spire whorls, spirals becoming obsolete on later whorls, and only 2-3 faint spiral grooves are visible at the base of the body whorl; the shell surface is also sculptured with microscopic crowded axial threads. Aperture moderately open, outer lip thickened and slightly varicose, interior with 13-14 moderately long denticles, columellar callus-shield absent apart from a slightly calloused siphonal fasciole, parietal wall with only a slight swelling but no distinct denticle, fasciole bordered by a brown ridge, base of columella with 1-2 folds. Brownish-orange in colour, marked with rather large, irregular white maculations which are occasionally edged in places by a fine dark brown margin, sutural rows of nodules marked by irregularly placed alternate dark brown and white blotches, anterior half of columella and aperture white.

TYPE LOCALITY. Te Raa Raa, Easter I, Pacific Ocean.

DISTRIBUTION. Tubuai Is to Easter I, Pacific Ocean. Habitat unknown.

Type specimens. The holotype of *N.albomaculatus* Rehder, is in the National Museum of Natural History, Washington, No. USNM-751615, length 16.9 mm, width 8.3 mm.

Material examined. EASTER IS: Te Raa Raa (USNM); TUBUAI IS: Rapa I (coll.Trondle).

The species is similar to *N.gaudiosus* (Hinds), but differs in shape, more convex whorls, lack of a parietal denticle and a distinct anal canal, presence of a microscopic axial sculpture, distinct colour pattern and complete absence of the orange-brown spiral lines.

Shorly after the taxon *Nassarius albomaculatus* was published by Rehder, it was found to be a secondary homonym of *Amycla cornicula* forma *albomaculata* Bucquoy, Dautzenberg & Dollfus, 1882, on the basis of Article 45(e)(i) of the Code of ICZN, and Dr.H.Rehder *(in litt.)* decided to publish a substitute name in due course. In the meantime, however, the Commission on Zoological Nomenclature amended Article 45(e)(i) [The Editor, 1981], and under the new amendment the epithet "forma *albomaculata"* Bucquoy, Dautzenberg & Dollfus, 1882, is deemed to be of infrasubspecific status and thus does not enter into homonymy, making a change of *Nassarius albomaculatus* Rehder, unnecessary.

Nassarius (Telasco) multipunctatus (Schepman, 1911)
(Plate 22, figs.1,2)

1911. *Nassa (Zeuxis) multipunctata* Schepman, Siboga-Exped. 49d:321, pl.20, figs.4a,b.
1982. *Nassarius multipunctatus* (Schepman), Cernohorsky, Bull.Mus.Nat.Hist.Nat.Paris (4), 3:989, pl.1,fig.2 (immature spec.).

Shell up to 16.0 mm in length, elongate-ovate and slender, teleoconch of 5-5¾ convex whorls, protoconch of 4-4¼ glassy-brown, carinate embryonic whorls, sutures very narrowly ledged; first 2-2½ post-embryonic whorls sculptured with axial ribs. 4-5 overriding spiral striae and very small sutural nodules, last 2-3 whorls smooth apart from 3-4 basal spiral cords. Aperture narrow, outer lip thickened and moderately variced, interior with up to 20 lirate denticles, lower half of columella narrowly calloused and with 2-3 short folds, area above parietal wall glazed, siphonal notch distinct, parietal denticle moderately small. Orange-brown to reddish-brown in colour, ornamented with small irregular spots and dashes which are frequently confluent, most of outer lip white but with a darker brown blotch at anterior end, sutures with white and darker brown spots, siphonal fasciole, columellar callus and aperture white.

TYPE LOCALITY. Haingsisi, Saman I near Timor, Indonesia, 23 m.

DISTRIBUTION. From East Africa to the Philippines and the Solomon Is. In clean and black coral sand, subtidal to a depth of 200 m.

Type specimens. Two syntypes of *N.multipunctatus* (Schepman) are in the Zoological Museum, University of Amsterdam, and Schepman's illustrated syntype from Haingsisi, length 15.4 mm, width 7.4 mm, is here designated as the lectotype (pl.22, fig.1).

Material examined. EAST AFRICA: W. Bank of Leven, Mozambique Channel, 12°32'S & 47°40'E, 35-150 m (MNHNP); INDONESIA: Banda I, 9-45 m (ZMA); PHILIPPINES: Punta Engano, Mactan I, Cebu, 200 m (coll.Marrow); PAPUA NEW GUINEA: Laing I, Hansa Bay, 60 m (coll.Tursch); SOLOMON IS: E. of Yandina, Russel I, 150-200 m (coll.Potter).

Nassarius (Telasco) vidalensis (Barnard, 1959)
(Plate 22, figs.3-5)

1959. *Nassa vidalensis* Barnard, Ann.Sth.African Mus. 45:118, textfig.24b; 1973 Kensley, Sea-shells South.Africa p.162, fig.607.

Shell up to 7.0 mm in length, ovate, moderately light in weight, teleoconch of 3¼ convex whorls, protoconch of 3¼-3¾ glassy, carinate embryonic whorls, carina on last whorl disappearing into suture, sutures narrowly ledged, first post-embryonic whorl sometimes with weak, low axial riblets, last two whorls almost smooth apart from 1-3 very finely incised spiral striae at sutures and 5-6 weak spiral cords at base of body whorl. Aperture narrow, outer lip thickened and broadly variced in mature specimens, interior with 10-13 small denticles, columella narrowly calloused and with 1 fold and 1-2 small denticles anteriorly, parietal denticle very feeble, siphonal notch distinct. Better preserved specimens glassy-white, ornamented with small, laterally elongated brown spots at sutures, base of body whorl with an interrupted brown band, back of varix with 1-2 brown spots. Beach specimens appear more uniformly waxen-white.

TYPE LOCALITY. Off Cape Vidal, Zululand, South Africa, 146-183 m.

DISTRIBUTION. From South Africa to N.W. Australia and Japan. Subtidal, to a depth of 183 m.

Type specimens. The holotype of *N.vidalensis* (Barnard), is in the Natal Museum, Pietermaritzburg, No. A-8839, length 6.3 mm, width 3.8 mm.

Material examined. SOUTH AFRICA: Off Cape Vidal, Zululand, 146-183 m (Natal Mus.); N.W. AUSTRALIA: W. of Bunbury, 33°03'S & 114°44' E, 156 m; W. of Jurien Bay, 30°45'S & 114°51'E, 143 m; *c.* 304 km N.W. of Port Hedland, 19°32'S & 115°49'E, 183 m (all AMS); PHILIPPINES: W. of Manila Bay, 13°32'N & 121°07'E, 130-137 m (MNHNP); CHINA: Straits of Taiwan, S. China Sea (NSMT); RYUKYU IS: off Miyako I, *c.* 150 m (NSMT); JAPAN: Enshu-Nada, Central Honshu (NSMT).

Nassarius (Telasco) shacklefordi (Melvill & Standen, 1896)
(Plate 22, figs.6-8)

1896. *Nassa (Telasco) shacklefordi* Melvill & Standen, J.Conch. 8:274, pl.9, fig.3.
1961. *Tarazeuxis shackelfordi (sic)* M. & St., Habe, Col.illust.shells Japan 2:64, pl.32,fig.14; ? 1975 Okutani, Venus: Jap.J.Malac. 33(4):192, pl.9, fig.11.
1972. *Nassarius (Telasco) shacklefordi* (Melvill & Standen), Cernohorsky, Rec. Auckland Inst.Mus. 9:165, fig.111.

Shell up to 15.0 mm in length but frequently smaller, ovate and shining, teleoconch of 3¾-4½ convex whorls, protoconch of 3½-4 glassy, carinate embryonic whorls; first 1-2 post-embryonic whorls axially ribbed, last 2-3 whorls smooth apart from base of body whorl with 4-5 fine spiral cords. Aperture narrow, outer lip thickened and variced, interior with up to 16 lirate denticles, columellar callus spreading on to body whorl as a circular white glaze, columella concave and smooth apart from 1-2 anterior denticles, siphonal canal prominent, anal canal distinct but parietal denticle feeble, base of outer lip longer than siphonal fasciole. Translucent-white or pinkish-rose in colour, ornamented with a fine network-pattern of greyish-white, somewhat trigonal spots, 2 faint bands on body whorl, small dark brown spots at sutures and occasionally an anterior brown blotch on the back of the outer lip, columellar glaze and aperture white. Operculum brown and serrate at margins.

TYPE LOCALITY. Lifu, Loyalty Islands.

DISTRIBUTION. From Lord Howe Is, Australia, to the Loyalty Is and tentatively Japan. In coral sand, usually subtidal to a depth of 44 m.

Type specimens. The holotype of *N.shacklefordi* (Melvill & Standen), is in the Manchester University Museum, length 10.0 mm, width 5.6 mm.

Material examined. AUSTRALIA: off Lord Howe I, 31°38'S & 159°03'E, 44 m (AMS); NEW CALEDONIA: False entrance, outer reef 10 km N.W. of Noumea (coll.Marrow); LOYALTY IS: (AMS; USNM).

The species has been reported from the Hawaiian Is by Kay (1979), but the Hawaiian specimens are not this species and are probably new to science. The specific name is frequently misspelled *"shackelfordi"*, but it has been named for the Rev. L. Shackleford.

Nassarius (Telasco) dimorphoides Oostingh, 1935
(Figs.116, 117)

1935. *Nassarius (Amyclina) dimorphoides* Oostingh, Weten. Med.Mijnb.Ned.-Indie No.26:79, textfigs. 4,5.

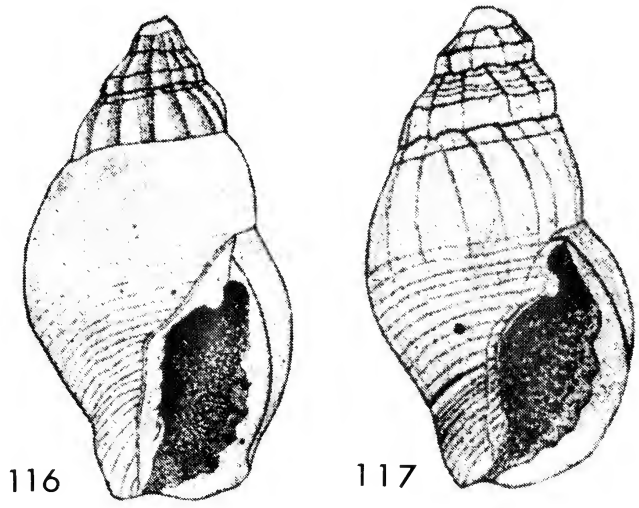
Shell up to 11.0 mm in length, pointedly ovate, consisting of 5 preserved whorls which are separated by a distinct but not deep suture, protoconch unknown. Central whorls with about 11 axial ribs per whorl; ribs somewhat angulate centrally; spiral striae anterior to sutures, both axial ribs and spirals become obsolete on last whorl. Body whorl slightly ventricose, lower half of body whorl striate. Aper-

ture ovate, outer lip thickened, subvaricose on back and with 5 denticles within; anterior half of columella descending almost vertically, columellar callus narrow and wrinkled, parietal denticle strong, anal canal prominent. [Abridged translation].

TYPE LOCALITY. Tjisaat, Boemiajoe, Java, Bioek beds, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The holotype of *N.dimorphoides* Oostingh, is in the Museum Bandoeng, Indonesia, No.P.J. 3053, length 11.0 mm, width 6.1 mm.



Figs. 116,117. Fossil Nassariinae. *Nassarius (Telasco) dimorphoides* Oostingh. 116. Type-figure of holotype; 11.0 mm. 117. Type-figure of paratype No.5. (from Oostingh, 1935, textfigs. 4,5).

Nassarius (Telasco) javanus (Schepman, 1891)
(Plate 22, figs.9-13)

1891. *Nassa javana* Schepman, Notes Leyden Museum 13:156, pl.9,figs.2a,b.
1911. *Nassa (Alectryon) elegans* var. *fulgurans* Schepman, Siboga-Exped.49d:314, pl.19,figs.10a,b.

Shell up to 23.0 mm in length, elongate-ovate, teleoconch of 5½-6¼ convex whorls, protoconch of 3¼ glassy embryonic whorls, last whorl finely carinate, sutures narrowly ledged or slightly canaliculate; post-embryonic whorls with slender axial riblets which start to fade out on penultimate whorl and are absent on the last 1-2 whorls; riblets are bisected by 4-6 spiral striae which produce a row of sutural nodules, spiral sculpture visible only anterior to sutures where spirals number from 1-3, base of body whorl with 3-7 cords and an additional 4-7 cords on the siphonal fasciole, back of outer lip with 4-6 crowded axial ribs. Aperture moderately narrow, outer lip thickened but only weakly variced, interior with 11-17 moderately short denticles, columellar callus partly spreading on to body whorl, moderately broad anteriorly but usually thinning and glazed above parietal wall, anterior of columella with 3-7 small denticles, siphonal and anal canals prominent. White in colour, ornamented with dark, almost blackish-brown blotches at sutures, body whorl with 1 central and occasionally another basal interrupted brown band, and an additional network of zigzag or trigonal brown markings, aperture and columellar callus white. Operculum brown and serrate at margins.

TYPE LOCALITY. Tjilatjap, S.Java, Indonesia *(javanus)*; between Wowoni and Buton I, Indonesia, 75-94 m, etc. *(fulgurans)*.

DISTRIBUTION. From Mozambique, East Africa, to the Solomon Is. In coral sand and shell-debris, subtidal to a depth of 94 m.

Type specimens. The holotype of *N.javanus* (Schepman), is in the Rijksmuseum van Naturlijke Historie, Leiden, No.62a, length 22.7 mm, width 13.0 mm. Two syntypes of *Nassa fulgurans* Schepman, are in the Zoological Museum, University of Amsterdam, and the syntype from Roma I measures length 19.5 mm, width 10.8 mm.

Material examined. EAST AFRICA: Beira, Mozambique, dredger dump (Natal Mus.); MALAYSIA: 9km S.E. of Singapore (ZMC); Batu Ferringhi, Penang (coll.McCausland); INDONESIA: Ruma Kuda Bay, Roma I, 36 m (ZMA); PAPUA NEW GUINEA: Laing I, Hansa Bay, 45-60 m (coll.Tursch); SOLOMON IS: Bonigi I (coll.Potter).

The typical form has a rotund body whorl whereas the form *fulgurans* is more slender with a slightly longer body whorl. In specimens from Penang, Malaysia, some individuals are typical *fulgurans* while a few specimens closely approach the typical form.

Nassarius (Telasco) helleri (Mari, 1929)
(Plate 23, figs.1, 2)

1929. *Nassa helleri* "Preston MS", Mari, Butl.Inst.Catal.Hist.Nat. (2), 8:136, pl.6,fig.3.
1929. *Nassa soror* "Preston MS", Mari, *ibid.*, (2), 8:141, pl.6,fig.7 (non Bellardi, 1882).

Shell up to 19.0 mm in length, elongate-ovate, some specimens broader than others, solid, teleoconch of 6½-7 convex whorls, protoconch unknown, sutures narrowly ledged; post-embryonic whorls sculptured with axial riblets and overriding spiral cords, sculpture becoming obsolete on later whorls except for 2-5 spiral cords anterior to sutures on the penultimate and from 1-4 cords on the body whorl suture, base of body whorl with 6-7 cords and 5-6 cords on the siphonal fasciole. Aperture moderately narrow, outer lip thickened and somewhat varicose, interior with 9 denticles, columellar callus moderately thick, roundly angled and partly extending on to the body whorl, columella concave and with 3-10 denticles, siphonal notch and anal canal distinct. Base colour cream to pale fawn, sutures ornamented with brown and light spots, columellar callus white to cream, aperture white.

TYPE LOCALITY. Ceylon [= Sri Lanka] *(helleri* and *soror).*

DISTRIBUTION. Sri Lanka. Habitat unknown.

Type specimens. The holotype of *N.helleri* (Mari), length 18.5 mm, width 10.9 mm, and the holotype of *Nassa soror* Mari, length 16.9 mm, width 9.2 mm, are both in the Institut des Sciences Naturelles de Belgique, Brussels.

This is a little understood species which is lacking in collections. Further material is required to confirm *N.helleri* as a valid taxon. Apart from the types, no other specimens have been sighted.

The species is similar to *N.javanus* (Schepman), but is slightly more solid, has a thicker and more defined columellar callus and lacks the bright colouring of that species. *Nassa soror* Mari, 1929, is a primary homonym of *N.soror* Bellardi, 1882.

Nassarius (Telasco) vinctus (Marrat, 1877)
(Plate 23, figs.3-8)

1853. *Nassa (Tritia) trifasciata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:113 (non *Buccinum trifasciatum* Gmelin, 1791 = *Nassarius*).
1877. *Nassa vincta* Marrat, Prop.new forms genus *Nassa* p.12; 1938 Tomlin, J.Conch.21:83; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:38.
1903. *Nassa analogica* Sowerby, Mar.Invest.Sth. Africa 2:219, pl.4,fig.2; 1906 E.A.Smith, Ann.Natal Govt.Mus. 1:36; 1959 Barnard, Ann.Sth. African Mus.45:99,fig.22a (radula); 1969 Barnard, Ann.Sth.African Mus.47:624; 1973 Kensley, Sea-shells S. Africa p.160, fig.585.
1903. *Nassa trifasciata* (A.Adams), Sowerby, Mar.Invest.Sth. Africa 2:228, pl.4,fig.2.
1903. *Nassa (Amycla) circumtexta* v.Martens, Wiss.Ergeb.deut.Tief.-Exped. "Valdivia" 7:27, pl.3,fig.18; 1903 Thiele, *ibid.*, 7:167, pl.9(4), fig.52 (radula).
1906. *Nassa circumtexta* Martens, E.A.Smith, Ann.Natal Govt.Mus. 1:36.
1928. *Nassarius circumtextus* (Martens), Tomlin, Ann.Sth. African Mus. 25:316.
1932. *Nassa aenigmatica* Turton, Mar.shells Pt. Alfred p.58, pl.13,fig.431.
1974. *Nassarius analogicus* (Sowerby), Adam & Glibert, Bull.Inst.R.Sci.Nat.Belg. 50(3):19, textfig.29 (operculum); p.21, textfigs.38,39 (radula); pl.4, fig.5 (shell).
1974. *Nassarius trifasciatus* (A.Adams), Adam & Glibert, *ibid.*, 50(3):56, pl.4, figs.3,4 (non *Buccinum trifasciatum* Gmelin, 1791 = *Nassarius*).
1975. *Nassarius vinctus* (Marrat), Cernohorsky, Rec.Auckland Inst.Mus. 12:154, figs.68-73 (figd. types of *vinctus, analogicus* and *trifasciatus*); 1976 Adam, Bull.Inst.R.Sci.Nat.Belg. 51(2):5, pl.3, fig.1 (figd.lectotype).

Shell up to 24.0 mm in length, elongate-ovate, teleoconch of 4½-5½ convex whorls, protoconch of 3-3¼ glassy-fawn embryonic whorls, carina lacking; sculptured with shallow or deep spiral grooves which give rise to flat or slightly elevated spiral cords, and ill-defined, irregular axial riblets may occur in some specimens, one angulate spiral cord interposed between body whorl and siphonal fasciole, centre of dorsum of body whorl with a varix in some individuals. Aperture moderately narrow, outer lip moderately thin and not variced, interior edge with ill-defined, short, low denticles, columellar callus spreading on to body whorl, rounded above parietal wall and then usually descending almost

vertically, columella smooth apart from a single fold anteriorly, parietal denticle absent, siphonal notch distinct, anal canal very shallow. White to pale fawn in colour, ornamented with 2-3 brown bands on body whorl, aperture and columella white, latter sometimes stained with chocolate-brown. Operculum brown, and according to Barnard (1959) with simple margins; one specimen examined, however, had 3 minute denticles on one side and a single anterior denticle on the other. Periostracum thin, translucent, pale straw or grey in colour and finely axially striate.

TYPE LOCALITY. None *(vinctus)*; Vigo Bay [= ? error] (*trifasciata* A.Adams); Cape Infanta, Sth. Africa, 73 m *(analogica)*; between Plettenberg Bay and Francis Bay, Sth. Africa, 100 m *(circumtexta)*; Pt.Alfred, Sth. Africa *(aenigmatica)*.

DISTRIBUTION. From S.W. to S.E. Africa. In sand, subtidal to a depth of 146 m.

Type specimens. The lectotype of *N.vinctus* (Marrat) [selected by Adam, 1976], length 16.9 mm, width 7.8 mm, and 4 paralectotypes are in the Merseyside County Museum, Liverpool. Three syntypes of *Nassa trifasciata* A.Adams, No.1973158, and three syntypes of *N.analogica* Sowerby, No.1903.7.27.77-79, are in the British Museum (N.H.), London, (for illustrations see Cernohorsky 1975a). The type of *N.circumtexta* v.Martens, is in the Zoological Museum, Humboldt University, Berlin, and the 7.0 mm long, juvenile holotype of *N.aenigmatica* Turton, is in the Oxford University Museum.

Material examined. SOUTH AFRICA: Buttal's Bay, False Bay, 55 m (ZMC); Cape Infanta, 73 m; Bird I lighthouse; Durban, Natal (all USNM); Cape Agulhas (coll.Cohen).

Literature records. WEST AFRICA: Angola, SOUTH AFRICA: W. coast Cape Peninsula; Pt. Alfred; Great Fish Bay; off East London; False Bay; off Cape Pt., 48-106 m; Saldanha Bay area, 40-146 m; St. Helena Bay, 27 m; 26°33'S & 15°00'E, 55 m (all Barnard 1959).

I have examined 135 specimens from a dredge-haul off Cape Agulhas, and several forms were represented: the smooth, spirally grooved form and the spirally corded form, and several individuals were also axially ribbed along all whorls of the teleoconch. Some specimens had a growth-varix in the form of a short linear fissure along the suture and then continuing axially as a flat varix, usually on the dorsal side of the body whorl.

Nassarius (? Telasco) mekranicus (Vredenburg, 1925)

1924. *Nassa (Telasco) mekranica* Vredenburg, Rec.Geol.Surv.India 55:74 (nomen nudum).
1925. *Nassa (Telasco) mekranica* Vredenburg, Mem.Geol.Surv.India 50:206, pl.9, figs.10,11.

"Shell medium, with fairly steep, slightly conoidal spire. The small protoconch, missing in the available specimens, is followed by five spire-whorls. The sutures are somewhat incised; whorls exhibit a convexity the curvature of which decreases in an anterior direction, a disposition frequently emphasised, at advancing stages of growth, by the presence of a slight angulation, close to the posterior margin, communicating to the spire somewhat of a stepped appearance. The whorls are decorated with oblique axial ribs which are somewhat curved with forward facing concavity, so that they are rather strongly antecurrent to the posterior suture and very steeply retrocurrent to the anterior suture. On the earlier part of the spire, their number is, at first, about 10 to each complete volution, gradually increasing to 14 on the last spire-whorl, or even to as many as 16 on the penultimate whorl. Occasionally some of the axial ribs may swell into ill-defined varices. The axial ornaments are crossed by delicate spiral threads; their number is 6 or less on the earlier whorls increasing to 12 or more on the later whorls. In those specimens in which the ribs disappear on the last spire-whorl, the spiral threads disappear also, with the exception, usually, of the circumsutural thread and the neighbouring threads on the circumsutural posterior step. Aperture posteriorly angulated and channelled, anteriorly deeply-notched dorsally, the short vertical columella is anteriorly bordered by a spiral fold, remainder smooth. The outer lip is not completely preserved in any of the available specimens. Spire and body whorl with occasional varices". (Abridged original description).

TYPE LOCALITY. 13.6 km south of Ban, a little to the west of the road to Gwadar, Kandelak-Garuki, 28.8 km N.W. by W. from Ormara, Mekran beds, Miocene of India.

DISTRIBUTION. Miocene of India.

Type specimens. The type-specimens of *N.mekranicus* (Vredenburg) are presumably in the Geological Survey of India collection. The original dimensions were length 26.0 mm width 13.0 mm.

The original illustrations lack quality and detail and are unsuitable for reproduction. The species identity can only be elucidated through examination of the type-specimens.

Subgenus **Zeuxis** H. & A. Adams, 1853

Zeuxis H. & A.Adams, 1853, Gen.Rec.Moll. 1:119. Type species by SD (Cossmann, 1901) *Buccinum taenia* Gmelin, 1791 = *B.olivaceum* Bruguière, 1789. Recent, Indo-Pacific.

1881. *Venassa* v. Martens, Conch.Mittheil. 2:109. Type species by M *Nassa (Venassa) pulvinaris* v.Martens, 1881 = malformed *Zeuxis* sp.

1969. *Glabrinassa* Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19(1):145. Type species by OD *G.amycliforma* Shuto, 1969. Recent Philippines.

1976. *Bathynassa* Ladd, Nautilus 90(4):131. Type species by OD *B.bolangoi* Ladd, 1976. Pleistocene, New Hebrides.

Shell moderately small, up to 45.0 mm in length, solid, whorls convex, sculptured with axial ribs, spiral striae and grooves; aperture generally wider, columella narrowly callouse and usually denticulate along its entire length. Outer lip thickened and usually not as distinctly variced as in *Niotha*, denticulate-lirate in interior, siphonal canal short.

Laterals of radula with 2 simple cusps, accessory lateral plates usually absent.

GEOGRAPHICAL DISTRIBUTION. Tropical Indo-Pacific.

STRATIGRAPHICAL RANGE. Miocene to Recent.

As remarked under the subgenus *Niotha, Zeuxis* is a not particularly well defined genus-group, and its value from a taxonomic viewpoint is doubtful. Several species which have been assigned to *Zeuxis* may equally as well have been placed in *Niotha*.

The subgenus contains 42 Recent species from the tropical Indo-Pacific and 25 fossil species.

Nassarius (Zeuxis) olivaceus (Bruguière, 1789)
(Plate 23, figs.9-15)

1789. *Buccinum olivaceum* Bruguière, Encycl.Meth.Hist.nat.vers 1:272 (ref. to Favanne, Conchyl., pl.33,fig.K2 and Gualtieri, pl.44,fig.3 with ?); 1833 Quoy & Gaimard, Voy. l'Astrolabe 2:442, pl.32,figs.13-15 (animal); 1834 Kiener, Spec.gen.icon.coq.viv. 9:59, pl.15,fig.53.

1791. *Buccinum taenia* Gmelin, Syst.Nat. ed.13:3493 (ref. to Knorr, Vergn. Augen Pt.5:pl.10,fig.3).

1852. *Nassa badia* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107; 1853 Reeve, Conch.Icon. 8:pl.19,fig.124.

1852. *Nassa mitralis* A.Adams, *ibid.* Pt.19:108; 1853 Reeve, Conch.Icon. 8: pl.19,fig.128.

1853. *Nassa olivacea* Bruguière, Reeve, Conch.Icon. 8:pl.3,fig.19; 1854 Rousseau, Voy.Pole Sud.Zool. 5:77, pl.21,figs.16,17; 1863 Fischer & Crosse, J.Conchyl. 11:377; 1931 van der Vlerk, Leid.geol.Meded. 5:234.

1853. *Nassa melanioides* Reeve, Conch.Icon. 8:pl.22,figs.150a,b; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:96.

1854. *Nassa fusca* Rousseau, Voy.Pole Sud.Zool. 5:74, pl.21,figs.7,8 (non *Buccinum corniculum* var. *fusca* Scacchi, 1836 = *Nassarius*).

1868. *Nassa approximata* Pease, Americ.J.Conch. 3:272, pl.23,fig.3.

1879. *Nassa taenia* (Gmelin), E.A.Smith, Proc.Zool.Soc.Lond. p.808; 1887 v. Martens, J.Linn.Soc.Lond. 21:180; 1889 Morlet, J.Conchyl. 37:135; 1890 Crosse & Fischer, J.Conchyl. 38:16; 1908 Hirase, Conch.Mag.Kyoto 2:pl.29, fig.79.

1883. *Nassa (Zeuxis) olivacea* (Bruguière), K.Martin, Samml.geol.Reichs-Mus.Leiden (1), 3:118; 1904 Jones & Preston, Proc.Malac.Soc.Lond. 6:144; 1915 Tesch in Wanner, Paleont.v.Timor 5:60, pl.81,figs.133a,b.

1903. *Nassa (Amycla) dimorpha* Cossmann, J.Conchyl. 51:145, pl.5,figs.12,13; 1924 Vredenburg, Rec.Geol.Surv.India 55:74.

1911. *Nassa (Zeuxis) taenia* (Gmelin), Schepman, Siboga-Exped. 49d:319; 1929 Dautzenberg, Faune Colon.Franc. 3:410; 1932 Dautzenberg, J.Conchyl. 76:34.

1916. *Arcularia taenia* Gmelin, Hedley, J.R.Soc.W.Australia 1:62.

1929. *Nassa (Zeuxis) taenia* var. *badia* A.Adams, Dautzenberg, Faune Colon.Franc. 3:410.

1934. *Nassa taenia* var. *mitralis* A.Adams, Mari, J.Conchyl. 78:43.

1939. *Nassarius (Zeuxis) olivaceus* (Bruguière), Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):179; 1954 Kira, Col.illust.shells Japan 1:56, pl.28, fig.27; 1972 Cernohorsky, Rec. Auckland Inst.Mus. 9:167, figs.112-114.

1955. *Nassa (Alectryon) taenia* (Gmelin), Marche-Marchad, J.Conchyl. 95:37.

1955. *Zeuxis taenia* (Gmelin), Cotton, R.Soc.Sth. Australia,Malac.Sect. No.7:2, fig.14.

1957. *Nassarius taenius* Gmelin, Kaicher, Indo-Pacific shells pl.7, fig.16; 1961 Spry, Tanganyika Note & Record No.56:23.

1966. *Tarazeuxis mitralis* (A.Adams), Habe & Kosuge, Shells world col. 2:62, pl.22,fig.29.

1966. *Zeuxis olivaceus* (Bruguière), Habe & Kosuge, Shells world col. 2:63, pl.22,fig.38.

1966. *Zeuxis exilis* (Powys), Habe & Kosuge, Shells world col. 2:63, pl.22, fig.41 (non *Nassa exilis* Powys, 1835).

Shell up to 45.0 mm in length, elongate-ovate, very solid, teleoconch of 7-8¼ convex whorls, protoconch of 2¾-3 smooth, glassy embryonic whorls, sutures either adpressed or narrowly canaliculate; sculptured with strong and frequently slightly oblique axial ribs, ribs either continue to

the body whorl or become obsolete on last 1-2 whorls; spiral sculpture consists of a shallow subsutural groove which gives rise to a row of sutural nodules, and numerous spiral striae which are either obsolete or usually more distinct on anterior half of body whorl where they are more prominent. Outer lip thick and narrowly variced, interior with strong denticles confined to edge of aperture, columella narrowly calloused, laminate anteriorly and with strong denticles along its entire length in mature specimens, siphonal notch prominent, anal canal very deep, outer lip opposite parietal denticle drawn out into a point. Tan to dark brown in colour, occasionally ornamented with 1-2 narrow pale bands, columella pale purple, aperture purple to purple-brown, denticles paler, and with a narrow pale band in interior. Operculum brown, simple or irregularly ragged at margins.

TYPE LOCALITY. Coast of Guadeloupe, American Ocean = error! *(olivaceus)*; none *(taenia)*; Sinaat, Province of N.Ilocos, Luzon, Philippines *(badia)*; Isinimalan, Negros I, Philippines *(mitralis)*; Moreton Bay, Australia *(melanioides)*; Solomon Is (*fusca* Rousseau); Polynesia = error! [on label with type is "Ascension I" = Ponape, Caroline Is] *(approximata)*; Karikal, Pliocene of India *(dimorpha)*. The first correct locality indication of Moluccas, Indonesia, is here designated as the type locality

DISTRIBUTION. From S.E. Africa to India, China and the Fiji Is. In mud and muddy sand, from the intertidal zone to a depth of 6 m.

Type specimens. Bruguiere's types are no longer extant, but the excellent original description of *N.olivaceus* in conjunction with the cited figures, clearly identify the species. The following type specimens are in the British Museum (N.H.), London: the immature holotype of *Nassa badia* A.Adams, No.197315, length 21.6 mm, width 10.0 mm; three syntypes of *N.mitralis* A.Adams, No.1973148, and the specimen measuring length 28.0 mm, width 15.6 mm, is here selected as the lectotype (pl.23, fig.10); two syntypes of *N.melanioides* Reeve, No.197351, and the immature syntype illustrated by Reeve (1853), length 19.8 mm, width 10.0 mm, is here selected as the lectotype (pl.23, fig.11). The holotype of *N.fusca* Rousseau, is in the Museum National d'Histoire Naturelle, Paris, length 28.0 mm, width 15.6 mm. The syntype of *N.approximata* Pease, which is in the Museum of Comparative Zoology, Harvard, No.MCZ-151800, length 24.5 mm, width 13.3 mm, is here selected as the lectotype (pl.23, fig.13). The juvenile type of *N.dimorpha* Cossmann, is probably in the Ecole des Mines, Paris.

Material examined. EAST AFRICA: Mozambique (USNM); SOUTH AFRICA: Saldanha Bay (AMS); MADAGASCAR: Cape Diego Bay, 6 m (ZMC); Tulear (SMOM); Nosi Be (USNM); MAURITIUS: (AMS; USNM; ZMC); INDIA: Calcutta (USNM); Goa (USNM); SRI LANKA: (AIM; AMS; USNM); ANDAMAN IS: (ZSI); THAILAND: Gulf of Thailand; Koh Phuket (both ZMC); Ao Nam Bor, Phuket; Ban Pa Khlok (both PMBC); Singora, Lem Sing and Lem Ngob, all Gulf of Thailand; Goh Jindarar Nua (all USNM); MALAYSIA: Singapore (AIM; SDMNH; USNM); Telok Assam, Sarawak (coll.Richardson); INDONESIA: Labuan, N. Borneo (LACM; USNM); Keledjitan, Bantam, Java; Welkomst Bay, Bantam, Java; Domaring, Borneo; Kudat Bay, N. Borneo; Sandakan, N. Borneo (all USNM); Bali (AMS); W. end of Teluk Kao, Halmahera, Malacca; between Palu and Donggala, Sulawesi; Pantai Pura, N. of Kupang, W. Timor; Nusa Tenggara, Timor (all coll.McCausland); PHILIPPINES: Donzol, Luzon (coll.Powell); Cebu City, Cebu I (AMS); Doural, Sorsogon (AIM); Jordan river, Guimaras; Ragay, Luzon; Tilig, Lubang; Missamis, N. Mindoro; Ilo Ilo, Panay I; Port Dupon, Leyte (all USNM); Zamboanga (coll. Dan); CHINA: Taiwan (coll.Allo); CAROLINE IS: Ponape (USNM); Sand I, Ponape (LACM); Ponape lagoon (coll.McCausland); WEST IRIAN: Sorendiori Bay, Soepiori, Schouten Is (coll.Powell); Mioes Woendi, Schouten I (USNM); Biak (AMS); PAPUA NEW GUINEA: Hood's Bay (SDMNH); Mebar, N. of Madang; Kapukapa; Taurama, Port Moresby; Talasea, New Britain (all AMS); Bogia, N. coast of Papua New Guinea (coll.Tursch); Rabarua, New Britain (coll. Parkinson); Madang (coll.Hoeter); AUSTRALIA: Queensland: Port Douglas (AIM); Cooya beach, N. of Port Douglas, (coll.Gardner); N. of Cooktown; Trinity Inlet, N. of Cairns; Port Douglas; Anam river, S. of Cooktown; Peel I, Moreton Bay; Eli creek, Hervey Bay; Gladstone; Saibai I, Torres Str.; Seaforth near Mackay; Four Mile Beach; Dunwich, Stradbroke I; Low Isles near Port Douglas; Sinclair Bay, Edgecumbe Bay (all AMS); Northern Territory: Darwin (coll.Hansen); SOLOMON IS: Wagina I, Choiseul I; Ata I, Malaita; Makeira harbour, San Christoval (all AMS); NEW CALEDONIA: Bourail (coll.Taylor); Noumea; Poindimie (both AMS); FIJI IS: Suva, S. Viti Levu (coll.Powell); Suva reef, S. Viti Levu (coll.Eker); Lami, S. Viti Levu (coll.Marrow); Suva Point (USNM); Ono I (AMS).

Fossil record. PLIOCENE: Kassi Marinu, Fialarang, Timor (K.Martin 1883); Kampang Fatoekau, Fialarang, Timor (Tesch in Wanner 1915); Karikal, India (Cossmann 1903 – as *N.dimorpha*); Tjimantjeuri, S.Bantam I (Oostingh 1939).

The axial sculpture is very variable in this and closely related species. The ribs may be obsolete on the last 1-3 whorls or they may continue to the body whorl and become only slightly weaker on the dorsal side. The smooth form has been described as *N.mitralis* A.Adams (with synonyms *badia, melanioides* and *fusca*) and the axially ribbed form as *N.approximata* (with synonym *dimorpha*). Both forms are frequently found in the same population and intergrades are well documented.

Nassarius (Zeuxis) crematus (Hinds, 1844)
(Plate 24, figs.1-6)

1844. *Nassa cremata* Hinds, Zool.Voy.H.M.S."Sulphur", p.35, pl.9,figs.8,9; 1853 Reeve, Conch.Icon. 8: pl.4,figs.26a,b.
1852. *Nassa ranida* A.Adams, Proc.Zool.Soc.Lond. Pt.19:97.
1853. *Nassa ravida (sic)*, A.Adams, Reeve, Conch.Icon. 8:pl.11,figs.68,74; 1887 v.Martens, J.Linn.Soc.Lond. 21:181.
1877. *Nassa pulcherrima* Marrat, Prop.new forms genus *Nassa* p.10, pl.1,fig.15.
1880. *Nassa quadrata* Marrat, Var.shells genus *Nassa,* p.103 (nom. subst. pro *Nassa cremata* Reeve, 1853) [non *N.quadrata* Conrad, 1830].
1897. *Nassa (Niotha) eucomista* Melvill & Standen, Proc.Malac.Soc.Lond. 2:169, pl.13, fig.11.
1914. *Nassa euglypta* Sowerby, Proc.Malac.Soc.Lond. 11:6, textfig.
1925. *Nassa martensi* Thiele, Wissen. Ergeb.deut.Tief.-Exped."Valdivia", 17:182, pl.20 (32), fig.10.
1927. *Nassarius (Hinia) kurodai* Makiyama, Mem.Coll.Sci.Kyoto Imp.Univ. (B), 3:121, pl.6, figs.3,4.
1931. *? Nassa (Hinia) kueneni* Koperberg, Jaarb.Mijnw.Ned.-Indie Lief.7:112, pl.3, fig.44 (is *N.crematus* fide Oostingh, 1939).
1934. *Nassa crenata (sic)* Hinds, Mari, J.Conchyl. 78:15,64 (invalid emend.).
1934. *Nassa crenata* var. *scutulata* Mari, J.Conchyl. 78:16 (nom. subst. pro *Nassa cremata* Reeve, 1853).
1939. *Nassarius (Zeuxis) siquijorensis* (A.Adams), Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):179, pl.16,fig.281 (non *Nassa siquijorensis* A.Adams, 1852).
1952. *Nassa costata* Adams, Satyamurti, Bull.Madras Govt.Mus., N.S. 1(2):183, pl.17,fig.5 (non S.V.Wood, 1848; nec A.Adams, 1852).
1964. *Zeuxis siquinjorensis (sic)*, A.Adams, Habe, Shells west.Pacific col. 2:100, pl.32,fig.24 (non *Nassa siquijorensis* A.Adams, 1852).
1972. *Nassarius (Zeuxis) crematus* (Hinds), Cernohorsky, Rec.Auckland Inst.Mus. 9:172, figs.123-125.
1982. *Nassarius crematus* (Hinds), Kaicher, Card cat.world-wide shells, Pack No.31: card 3218.

Shell up to 33.0 mm in length, elongate-ovate to barrel-shaped, teleoconch of 5-6½ convex whorls, protoconch of 3-3½ glassy, finely carinate embryonic whorls; sculptured with close-set, numerous axial ribs which number from 25-40 on the last 2 whorls; spiral sculpture consists of overriding spiral cords which decussate axial ribs into small nodules and form 5-7 rows of spirals on the penultimate and from 14-20 rows on the body whorl apart from 4-6 cords on the siphonal fasciole; sutural nodules are either distinct or sometimes merge with the remaining granulose sculpture. Aperture moderately wide, outer lip thickened but not strongly variced, denticulate-lirate within, edge of outer lip occasionally with small spinose denticles, columellar callus either narrow and well bordered or broadly laminate anteriorly, columella distinctly wrinkled along its entire length. White, cream, fawn or light grey in colour, ornamented with 1-3 moderately broad brown bands on body whorl, bands occasionally more saturated on the dorsal side; columella and edge of outer lip white to cream, aperture occasionally flushed with brown.

TYPE LOCALITY. None *(crematus)*; Burias, Philippines, 11m *(ranida)*; Borneo and New Holland [= Australia] *(pulcherrima)*; Straits of Malacca, Indonesia *(quadrata* and *scutulata)*; Andaman Is *(eucomista)*; Kii, Japan *(euglypta)*; Dar-es-Salaam. E. Africa *(martensi)*; Dainiti, Totomi province, Kakegawa series, L.Pliocene of Japan *(kurodai)*; Niki Niki, Timor, Pliocene of Indonesia *(kueneni)*. Malacca Straits, Indonesia, is here designated as the type locality (specimens in USNM).

DISTRIBUTION. From East Africa to India, Japan and the Fiji Is. In muddy sand, clay and soft mud, subtidal to a depth of 205 m.

Type specimens. The following type specimens are in the British Museum (N.H.), London: two syntypes of *N.crematus* (Hinds) [no number], and the smaller specimen measuring length 26.7 mm, width 15.1 mm, which appears to have been illustrated by Hinds (1844), is here selected as the lectotype (pl.24, fig.1); three syntypes of *Nassa ranida* A.Adams, No.1973123, and the specimen measuring length 18.8 mm, width 10.2 mm, is here designated as the lectotype (pl.24, fig.2); the holotype of *N.eucomista* Melvill & Standen, No.1897.6.30.2, length 17.2 mm, width 8.7 mm, and the holotype of *N.euglypta* Sowerby, No.1914.4.2.6, length 29.4 mm, width 14.4 mm. Two syntypes of *N.pulcherrima* Marrat, are in the Merseyside County Museum, Liverpool, and the immature specimen measuring length 13.9 mm, width 6.8 mm, is here designated as the lectotype (pl.24, fig.5). The holotype of *N.martensi* Thiele, is in the Zoological Museum, Humboldt University, Berlin, length 15.5 mm, width 9.0 mm, and the holotype of *Nassarius kurodai* Makiyama, is in the Kyoto Imperial University, Japan, length 18.3 mm, width 10.4 mm.

Material examined. MADAGASCAR: 12°40'S & 48°18'E, 185-205 m (Natal Mus.); INDIA: off Tranquebar, 11°06'N & 80°05'E, 20-94 m (ZMC); ANDAMAN IS: (ZSI); THAILAND: Ko Chang I, E. side Gulf of Thailand, 9 m; Koh Kut; coast of Lem Ngob; Tung Kaben; Koh Kong, 15 m; W. of Koh Chuen; 19 km E. of Koh Mak,

38 m; Koh Bidama, 17 m; 32 km S. of Koh Samit, 37 m; Koh Kahdat, 11 m (all ZMC); Khan Nu Paknam, Gulf of Thailand; Bangbert Bay (both USNM); MALAYSIA: Singapore (Merseyside Cty.Mus.,Liverpool; ZMC); Penang (ZMC); INDONESIA: Between Sumatra and Java, 6°42'S & 105°17'E, 42 m; Java, 8°29'S & 114°40'E, 200 m (both ZMC); Jamdena Strs., E. of Wotap I, Tanimbar, 64-73 m; 8 km N. of Labuan Olendir, Selaru, Tanimbar, 51-59 m; W. end of Udjir I, Wokam, Aru Is, 55-60 m; W. of Babi I, Wokam, Aru Is, 55-64 m (all WAM); off Bunting I, Malacca Strs.; Tamandjaijai, Bantam (USNM); Brunei Bay, Sabah (AMS); Makassar Str., 1°56'S & 119°17'E, 134-186 m (MNHNP); PHILIPPINES: off Pitogo, Luzon, 165 m; off Tayabas, Luzon, 194 m; N. of Marinduque, 196 m; Ragay Gulf, off N.Burias, 192 m; E. of Burias, 192 m (all USNM); Punta Engano, Mactan I, Cebu (coll.Dan); Davao, off Dumalag I, 183 m (coll.Norton); off Batangas, 13°16'N & 122°46'E, 166-172 m (MNHNP); CHINA: Straits of Taiwan, S.China Sea, *c.* 150 m (NSMT); off Pratas I, China Sea, 113 m (USNM); E. side Mirs Bay, S.E. Ping Chan I, China coast (AMS); JAPAN: Minoshima, Wakayama-ken; Tokushima (both coll.Powell); Tosa; Nagasaki (both ZMC); Kagoshima; Tosa Bay (both USNM); Tatsugahama, Wakayama Prefecture, Honshu, 30-50 m (NSMT); WEST IRIAN: S. Momtoewoeri Pt., Koeroedoi I, Geelvink Bay, 7 m (coll.Powell); PAPUA NEW GUINEA: Wagusarik, Head of Gogol river near Ramu (NZGS); Kilmeri village, N.W. coast of Papua New Guinea; S.W. of Yule I (both AMS); Laing I, Hansa Bay, 35 m (coll.Tursch); AUSTRALIA: Queensland: Daydream I, Whitsunday Passage; Horseshoe Bay, Magnetic I (coll.Powell); Yorkey's Knob, N. of Cairns; Seaforth near Mackay; Inside Wentworth reef; Lucinda; Airlie Beach; Buchan's Pt. Near Cairns; Mapoon, Batavia river, Gulf of Carpentaria; Lindeman I, Whitsunday Passage; Shelley beach, N. of Townsville; Keppel Bay; Cairns Harbour; Albany Passage, 7-26 m; Low Isles near Port Douglas; Clifton Beach, N. of Cairns (all AMS); Northern Territory: Darwin (AMS; Natal Mus.); Port Essington (BMNH); 3. 240 km N. of Coburg Peninsula; Yirrkala (both AMS); SOLOMON IS: Kieta, Bougainville (coll.Whitehead); Hetabeta I, Santa Isabel group (coll.Bratcher); Nuotha I, off Guadalcanal (coll.Dillworth); LOYALTY IS: Ouvea I (coll.Coles); FIJI IS: Manava I, N. off Viti Levu (coll.WOC); Akuilau I, Nadi Bay (AMS; USNM); Lautoka, W. Viti Levu (AMS).

The species is variable in shape, some specimens being broader than others. The typical form *crematus* is the broad, occasionally barrel-shaped form (= *ranida* = *kurodai*), and *eucomista* Melvill & Standen, is the slender form of the species, while *euglypta* Sowerby and *pulcherrima* Marrat, are intermediate between the two forms.

Nassarius (Zeuxis) castus (Gould, 1850)
(Plate 24, figs.7-17; plate 25, figs.1-10)

1847. *Buccinum rufum* Dunker, Zeit.f.Malakozool. 4:59 (non Linnaeus, 1758).
1850. *Nassa casta* Gould, Proc.Boston.Soc.Nat.Hist. 3:154; 1852 Gould, U.S.Expl.Exped. 12:260, pl.19,figs.328,328a,b; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:52.
1852. *Nassa caelata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:97; 1853 Reeve, Conch.Icon. 8:pl.20, fig.133.
1852. *Nassa costata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:98 (non S.V.Wood, 1848).
1854. *Nassa vitiensis* Rousseau, Voy.Pole Sud.Zoole. 5:79, pl.21,figs.23-25.
1870. *Niotha caelata* A.Adams, Ann.Mag.Nat.Hist. (4), 5:425.
1874. *Nassa elongata* Marrat, Ann.Mag.Nat.Hist. (4), 13:70; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:36 (non *Buccinum elongatum* J. de C.Sowerby, 1815 = *Nassarius*).
1877. *Nassa sinensis* Marrat, Prop.new forms genus *Nassa*, p.4; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:38.
1880. *Nassa oriens* Marrat, Var.shells genus *Nassa*, p.44 (nom. subst. pro *N.elongata* Marrat, 1874); 1940 Tomlin, Proc.Malac.Soc.Lond. 24:37.
1880. *Nassa lactea* Marrat, Var.shells genus *Nassa*, pp.54,80; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:36.
1882. *Nassa (Zeuxis) levukensis* Watson, J.Linn.Soc.Lond. 16:363; 1886 Watson, Rept.Sci.Res.Voy.H.M.S. "Challenger" 15:181, pl.11,fig.3.
1895. *Nassa (Hinia) verbeeki* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.F., 1:110, pl.17, figs.247-255 (mixture of forms).
1900. *Nassa thaumasia* Sturany, Anz.k.Akad. Wiss.math.-nat.Classe, Wien, No.17:198; 1903 Sturany, Denk.k.Akad.Wiss.Wien 74:222, 243, pl.2, figs.8a,b.
1901. *Nassa (Alectryon) caelata* (Adams), Melvill & Standen, Proc.Zool.Soc.Lond. 2:409.
1903. *Nassa (Telasco) verbeeki* (Martin), Cossmann, J.Conchyl. 51:142, pl.5, figs.8,9; 1924 Vredenburg, Rec.Geol.Surv.India 55:74.
1903. *Nassa maldivensis* E.A.Smith, Fauna & Geog.Maldive & Laccadive Arch.2(2):606, pl.35,figs.6-8.
1903. *Nassa mulukuensis* E.A.Smith, *ibid.*, 2(2):607, pl.35,figs.9,10.
1925. *Nassa incognita* Thiele, Wiss.Ergeb.feut.Tief.-Exped."Valdivia", 17:183, pl.20(32), fig.11 (non Peyrot, 1925).
1927. *Nassarius (Hinia) caelatus dainitiensis* Makiyama, Mem.coll.Sci.Kyoto Imp.Univ. (B), 3:122, pl.5,figs.17,18.
1928. *Nassa (Hinia) verbeeki* Martin, Yokoyama, Imp.Geol.Surv.Jap.Rept.No.101:40, pl.2,figs.9,13.
1931. *? Nassa (Hinia) verbeeki* subsp. *fekuensis* Koperberg, Jaarb.Mijnw.Ned.-Indie Lief.7:111.
1931. *? Nassa (Hinia) verbeeki* subsp. *fischeri* Koperberg, *ibid.*, Lief.7:112 (non Bellardi, 1882; nec Dautzenberg, 1912).

1936. *Nassarius caelatus* (A.Adams), Hirase, Coll.Jap.shells ed.5:75,pl.106,fig.5; 1937 Nomura, Jap.J.Geol.Geog. 14:76; 1960 Tsuchi, Repts.Lib.Arts Sci. Fac.Shizuoka Univ. 3:74, fig.11.
1946. *Nassa (Hinia) vitiensis* Hombron & Jaquinot, Abrard, Ann.Paleont.Paris 32:74, pl.5,fig.10.
1954. *Nassarius (Zeuxis) kiiensis* "Kuroda MS", Kira, Col.illust.shells Japan, 1:56, pl.28,fig.21 (nomen nudum).
1959. *Nassarius (Zeuxis) kiiensis* "Kuroda MS", Kira, Col.Illust.shells Japan, rev.ed. 1:73, pl.28,fig.21.
1960. *Nassarius (Niotha) caelatus* (A.Adams), MacNeil, U.S.Geol.Surv.Prof.Pap. No.339:79, pl.13,fig.30.
1960. *Nassarius (Zeuxis) minoensis* Itoigawa, J.Earth Sci.Nagoya Univ. 8:289, pl.6, figs.1a-c; 1967 Masuda, Trans.Proc.Palaeont.Soc.Japan, N.S., 65:8, pl.2,figs.7a,b, 8a,b.
1962. *Nassarius (Zeuxis) miyazakiensis* Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 12:54, pl.8,fig.10, text-figs.4b, 10.
1962. *Zeuxis kiiensis* Kira, Shells West.Pacific col.1:81, pl.29,fig.21.
1966. *Zeuxis crenulatus* (Lamarck) var., Habe & Kosuge, Shells world col.2:63, pl.22,fig.36.
1966. *Zeuxis crenulatus* (Lamarck) Habe & Kosuge, *ibid.* 2:63,pl.22,fig.42.
1967. *Zeuxis caelatus* (A.Adams), Habe & Kosuge, Stand.book Jap.shells 3:76, pl.29,fig.35.
1969. *Nassarius (Zeuxis) caelatus verbeeki* (Martin), Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19:133, pl.11, figs.9,10,14,18-20; pl.12,fig.16; pl.24,fig.10.
1972. *Nassarius (Zeuxis) caelatus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:174, fig.126.
1972. *Nassarius (Zeuxis) vitiensis* (Hombron & Jaquinot), Cernohorsky, *ibid.* 9:175, figs.127-129 (shell), fig.144 (radula).
1982. *Nassarius nodiferus* (Powys), D. & E.Bosch, Seashells of Oman, p.106, centre figs. (non *Nassa nodifera* Powys, 1835).

Shell up to 33.0 mm in length, elongate-ovate, solid, early whorls sub-angulate at sutures, last whorl occasionally inflated, width 46%-62% of length, teleoconch of 6-7½ convex whorls, protoconch of 3-3½ glassy, carinate embryonic whorls, sutures very narrowly canaliculate; sculptured with thick or slender axial ribs, ribs numbering from 0-27 on the penultimate and from 0-30 on the body whorl, axial ribs either continue to the outer lip of the body whorl or become obsolete on last 1-3 whorls; spiral sculpture consists of fine spiral striae or grooves which are usually confined to the interspaces and number from 0-5 on the penultimate and from 0-7 on the body whorl, followed by 5-6 spiral cords and an additional 3-6 cords on the siphonal fasciole, spiral sculpture almost obsolete in some individuals, sutural nodules well defined. Aperture moderately wide, outer lip thickened but not strongly varicose, interior with 10-17 lirate denticles, edge of outer lip simple or with a few spinose denticles, columella narrowly calloused and with 5-18 small denticles, siphonal and anal canals distinct. Cream, yellowish-brown, fawn to brown in colour, ornamented with paler, ill-defined spiral bands, dorsal side sometimes with short dark brown bands, columellar callus white, aperture white but occasionally darkening towards interior. Operculum brown, margins simple or serrate or irregularly jagged.

TYPE LOCALITY. Pacific Ocean *(castus)*; none *(rufum; lactea)*; Cagayan, Mindanao, Philippines, 46 m *(caelata)*; Burias I, Philippines, 11 m (*costata* A. Adams); Viti Isles [= Fiji Is] *(vitiensis)*; China Seas *(elongata* Marrat; *oriens; sinensis)*; Levuka, Fiji Is, 22 m *(levukensis)*; Sonde, Java, Pliocene of Indonesia (lectotype of *verbeeki*); S.Male Atoll, 2-55 m, etc., Maldive Is *(maldivensis)*; Mulaku Atoll, Maldive Is, 2-73 m *(mulukuensis)*; Ras Abu Somer, Red Sea *(thaumasia)*; ? Dar-es-Salaam, East Africa *(incognita)*; Dainiti, Totomi province, Kakegawa series, L.Pliocene of japan *(dainitiensis)*; Toi Oesapi Soka, Timor, Pliocene of Indonesia *(fekuensis)*; Niki Niki, Timor, Pliocene of Indonesia (*fischeri* Koperberg); Kii, Japan, 18-37 m *(kiiensis)*; Shukubora, Gifu Prefecture, Mizunami group, Miocene of Japan *(minoensis)*; Nihoumatsu, Takanabe machi, Koyu-gun, Miyazaki Prefecture, L.Pliocene of Japan *(miyazakiensis)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf to South Africa, Japan and the Samoa Is. In weedy sand, gravel, clay and mud, subtidal to a depth of 150 m.

Type specimens. The holotype of *N.castus* (Gould), is in the National Museum of Natural History, Washington, No.USNM-5724, length 10.4 mm, width 5.3 mm, and the holotype of *Buccinum rufum* Dunker, is in the Zoological Museum, Humboldt University, Berlin, length 20.5 mm, width 13.0 mm. The following type-specimens are in the British Museum (N.H.), London: three syntypes of *Nassa caelata* A.Adams, No.1973122, and the specimen measuring length 16.4 mm, width 9.0 mm, is here selected as the lectotype (pl.24, fig.14); three syntypes of *N.costata* A.Adams, No.197327, and the specimen measuring length 14.7 mm, width 8.0 mm, is here designated as the lectotype (pl.24, figs.8,9). Four syntypes of *N.levukensis* Watson, No.1887.2.9.6.45-8., and the specimen measuring length 17.8 mm, width 9.3 mm, is here designated as the lectotype (pl.24, fig.15); three syntypes of *N.maldivensis* E.A.Smith, No.1903.9.17.54-56, and the specimen measuring length 25.0 mm, width 14.5 mm, is here designated as the lectotype (pl.25, fig.5); and the holotype of *N.mulukuensis* E.A.Smith, (no number), length 24.0 mm, width 12.5 mm. The holotype of *N.vitiensis* Rousseau, is in the Museum National d'Histoire Naturelle, Paris, length 24.5 mm, width 13.6 mm, and the holotype of *N.incognita* Thiele,

is in the Zoological Museum, Humboldt University, Berlin, length 18.6 mm, width 10.6 mm. The following type specimens are in the Merseyside County Museum, Liverpool: two syntypes of *N.oriens* Marrat (also types of *N.elongata* Marrat), and the specimen measuring length 19.0 mm, width 8.8 mm, is here selected as the lectotype (pl.24, fig.11); the holotype of *N.sinensis* Marrat, length 16.4 mm, width 9.8 mm; and two juvenile syntypes of *N.lactea* Marrat, and the specimen measuring length 16.1 mm, width 8.3 mm, is here designated as the lectotype (pl.24, fig.16). Several syntypes of *N.verbeeki* K.Martin, are in the Rijksmuseum van Geologie en Mineralogie, Leiden, and the specimen illustrated by Martin (1895) on plate 17, figs. 247, 247a, No.RGM-9493, length 29.8 mm, width 17.0 mm, is here designated as the lectotype (pl.25, fig.3). The holotype of *N.thaumasia* Sturany is in the Natural History Museum, Vienna, length 27.2 mm, width 13.0 mm. I did not locate the types of *N.kiiensis* Kira. The types of fossil species are in the Institutions in whose Journals they were described.

Material examined. RED SEA: off Eilat, Gulf of Aqaba, 46-49 m; Dahab (both TAU); Dahlak Archipelago, 14°58'N & 40°19'E, 9-12 m and 15°33'N & 40°23'E (TAU); PERSIAN GULF: 7 km S.W. of Suzeh, Mormuz Str., 11 m; 3 km W. of Ayanat, 27°43'N & 52°08'E, 7 m; 3 km S.E. of N. end of Quais I, 26°32'N & 54°04'E, 27 m; N.W. of Kharg I, 29°20'N & 50°18'E, 32 m; 40 km S.E. of Lanaks, 36°33'N & 56°42'E, 64 m (all ZMC); EAST AFRICA: Chango I, W.Zanzibar, 26-27 m (coll.Powell); off Beira, Mozambique, 20°08'S & 35°33'E, 100 m (ZMC); SOUTH AFRICA: Durban, Natal; Salisbury I, Durban Bay (both Natal Mus.); MADAGASCAR: Tulear (SMOM); REUNION I: Baie de la Possession, 175 m (coll.Martin); MAURITIUS: (AMS); Cannonier's Pt.; Graved Bay, 4-5 m (both ZMC); INDIA: Madras (AMS); off Ganges Delta, 20°49'E & 88°40'E, 75 m (ZMC); SRI LANKA: (USNM); N.W. coast, 9°16'N & 79°28'E (AMS); THAILAND: Phuket I; Gulf of Thailand, 10°25'N & 101°29'E, 72 m; 27 km W. of Koh Kut, 56 m (all ZMC); MALAYSIA: Singapore (AMS); INDONESIA: Teluk Dodinga near Ternate, Halmahera, 31-42 m; 8 km N. of Labuan Olendir, Selaru, Tanimbar (both WAM); Keledjitan, Bantam, Java; Sibuko Bay, Borneo, 70 m (both USNM); Carita Beach, N. of Labuan, W. Java (coll.McCausland); Toeal, Kei-Oerne, kai Is, 20 m; Pulo Babo, S.Java, 5°54'S & 106°12'E, 24 m; Sunda Str., 6°38'S & 105°21'E, 35 m; near Java, 8°30'S & 114°28'E, 70-150 m; Samaloma, Macassar, 35 m; near Onrust, Java, 10 m; Saparoea Bay, 18 m; E. of Krakatoa, 75 m; 7°25'S & 114°30'E, 100 m; Amboina Bay, 128 m (all ZMC); Ceram I, 15 m (coll.Richardson); Makassar Str., 1°08'S & 117°18'E, 49 m (MNHNP); PHILIPPINES: Cebu; Cardos Bay, Mindanao, 9°36'N & 125°46'E, 22 m (both ZMC); Mantaquin Bay, Palawan group; Cebu City; Port Binang, Subic Bay, Luzon; Catbalonga, Samar; Linapacan Str., 84 m; Cebu, *c.* 150 m; W. of Bucas Grande I, 80 m; off Nagubat I, E.Mindanao, 80 m; Bagaong, Mindoro; Manila Harbour, Luzon; off Observatory I, Palawan group, 84 m; N. of Corregidor I, 51 m (all USNM); Tayabas Bay; Punta Engano, Mactan I, Cebu (both coll.Dan); VIETNAM: Nhatrang Bay, N. of Honlong, 10-15 m (ZMC); TAIWAN: (coll.Allo); JAPAN: Enoshima; Tokyo Bay, Honshu, 9-15 m; off Hondo, 66 m; Awa, Shikoku; Suruga Gulf; Korea Strait, 121 m; Nagasaki (all USNM); Tokushima (AMS); Misaki, 132 m; Okinose, Sagami Bay (both ZMC); Toyohama, Chita Peninsula (NZGS); Tatsugahama, Wakayama Prefecture, Honshu, 30-50 m (NSMT); WEST IRIAN: near Hollandia (USNM); Mioes Woendi, Geelvink Bay, 4 m (AIM); PAPUA NEW GUINEA: Rabaul, New Britain (coll.Eker); Tatana I, Port Moresby, 10-15 m (ZMC); Nordup and Simpson Harbour, both New Britain (coll.Parkinson); Laing I, Hansa Bay (coll.Tursch); Port Moresby (coll.Franklin); AUSTRALIA: Queensland: Magnetic I (coll.Powell); off Cape Upstart, 37 m; Lindeman I, Whitsunday Passage; Albany Passage, Cape York Peninsula; Low Isles near Port Douglas; N. of Eagle I; Turtle I, 14 m; Linden Bank, 67 m; Toogoom Beach; Murray I, Torres Str.; (all AMS); Yorkey's Knob, N. of Cairns (coll.Powell); near Cairns reef, 11-18 m (coll.Marrow); SOLOMON IS: Treasury I (coll.Gardner); Kieta, Bougainville (coll.Whitehead); Surunda, Espiritu Santo (coll.Coles); NEW HEBRIDES: Port Havannah, Efate I (coll.Eker); Teuma Bay, Efate I, 46 m (coll.Colardeau); NEW CALEDONIA: Hienghene (AMS; MNHNP); Noumea (coll.Aillaud); 22°17'S & 167°05'E, 80 m (MNHNP); FIJI IS: Momi Bay, W. Viti Levu, 27 m (USNM); Caboni Beach, N.E. Viti Levu (coll.Eker); Main Suva reef, S. Viti Levu (coll.Northgrove); SAMOA IS: Apolima Str. (coll.Powell).

The species is extremely variable, and consequently has received no fewer than 20 names. It is the *"Nassarius crenulatus"* of some authors, but probably not of Bruguière, 1789, a species whose identity remains unknown, and neither is it the *"Nassa crenulata* Lamarck, 1816" which is probably the species *Nassa scalaris* A.Adams, 1852.

The species varies a great deal in shape, size and sculpture, and produces several forms throughout its distributional range:

typical form *castus* Gould: a small, few-ribbed form with continuous ribs, and which is closely similar to *rufum* Dunker, *costata* A.Adams, and *minoensis* Itoigawa.

Forma *caelata* A.Adams: this form has more numerous axial ribs which also continue to the body whorl, and the taxa *vitiensis* Rousseau, *oriens* Marrat, *lactea* Marrat, *levukensis* Watson, *verbeeki* K.Martin, *incognita* Thiele, *dainitiensis* Makiyama and the juvenile *miyazakiensis* Shuto, have all been based on this or a slight variation of the *caelata* form.

Forma *maldivensis* E.A.Smith: this form lacks sculpture on the last 1-3 whorls with the exception of spiral cords on the ultimate third of the body whorl. *N.mulukuensis* E.A.Smith, and *N.thaumasia* Sturany, are slender examples of this form and *N.kiiensis* Kira, is intermediate between the slender and broad forms.

I have examined several hundred specimens in an attempt to find a character or characters which would aid in the separation of some of the listed forms as valid species. It was found, however, that these forms usually occur within a single population and numerous intermediate specimens connect the end-members to each other. Habe & Kosuge (1966) were the first authors to combine the ribbed and smooth forms of the species under the taxon *"crenulata* Bruguière".

N.castus is less barrel-shaped and lacks the granulose sculpture of *N.crematus* (Hinds).

Nassarius (Zeuxis) eusulcatus (Sowerby, 1902)
(Plate 25, fig.11)

1902. *Nassa eusulcata* Sowerby, Marine Invest.Sth.Africa 2:94, pl.2,fig.8; 1903 E.A.Smith, Proc.Malac.Soc.Lond. 5:373; 1959 Barnard, Ann.Sth.African Mus. 45:112, fig.22f (radula); 1973 Kensley, Sea-shells South.Africa p.160, fig.592.
1928. *Nassarius eusulcatus* (Sowerby), Tomlin, Ann.Sth.African Mus. 25:317.

Shell up to 23.0 mm in length, elongate-ovate, solid, teleoconch of 6½-7 weakly convex whorls, protoconch of 3 glassy embryonic whorls, sutures tight; sculptured with distinct axial ribs which number from 18-23 on the penultimate and from 20-30 on the body whorl; spiral sculpture consists of spiral striae which either touch the walls of the axial ribs or override these, striae number from 4-6 on the penultimate and from 14-15 on the body whorl, last 5-6 striae becoming somewhat stronger and nodulose towards the base of the body whorl. Aperture moderately narrow, outer lip thickened but not strongly varicose, interior with 8-9 lirate denticles, columella narrowly calloused and with 9-11 denticles, parietal denticle distinct, siphonal notch and anal canal prominent. Uniformly creamy-white to brown in colour. Operculum serrate at margins according to Barnard (1959).

TYPE LOCALITY. Mouth of Tugela river, South Africa, 84 m.

DISTRIBUTION. South Africa. In mud and sand, subtidal to a depth of 100 m.

Type specimens. The holotype of *N.eusulcatus* (Sowerby), is in the British Museum (N.H.), London, No.1902.5.28.64., length 19.3 mm, width 9.6 mm.

Material examined. SOUTH AFRICA: Durban, Natal, *ex-pisces*; between Umkomaas and Port Edward, *ex-pisces* (both Natal Mus.).

The species is hardly separable from the axially ribbed form of *Nassarius castus* (Gould), however, insufficient material has been seen to place it unequivocally in synonymy. Typical specimens of *N.castus* have also been seen from Natal.

Nassarius (Zeuxis) falconeri (d'Archiac & Haime, 1854)
(Fig. 118)

1850. *Buccinum serratum* Brocchi, d'Archiac, Hist.progr.Geol.Soc.France 3:296 (non Brocchi, 1814).
1854. *Buccinum falconeri* d'Archiac & Haime, Desc.anim.foss.numm.l'Inde p.319, pl.31, figs.10,10a,11.
1924. *Nassa (Telasco) falconeri* (d'Archiac & Haime), Vredenburg, Rec.Geol.Surv.India 55:74; 1925 Vredenburg, Mem.Geol.Surv.India 50:205.

"Shell turreted, consisting of six convex whorls, separated by a sub-canaliculate suture, covered with narrow, curved axial ribs, equal and posteriorly ending in twin tubercles along the suture. The intervening spaces are twice as broad as the ribs, concave, and decorated with very delicate, linear, transverse striations crossed by lines of growth which are still more delicate and just as regular. The base of the body-whorl carries seven concentric striations, more pronounced, wider-spaced and continuous, crossing the ribs upon which they isolate small granulations, becoming more crowded until they reach the extremity of the columella. Aperture unknown. Probable height 22.0 mm, diameter of the body whorl 10.0 mm.

Var.a — We regard as a separate variety, a shell distinguished by its shorter though steeper spire, and by its broader and wider-spaced ribs.

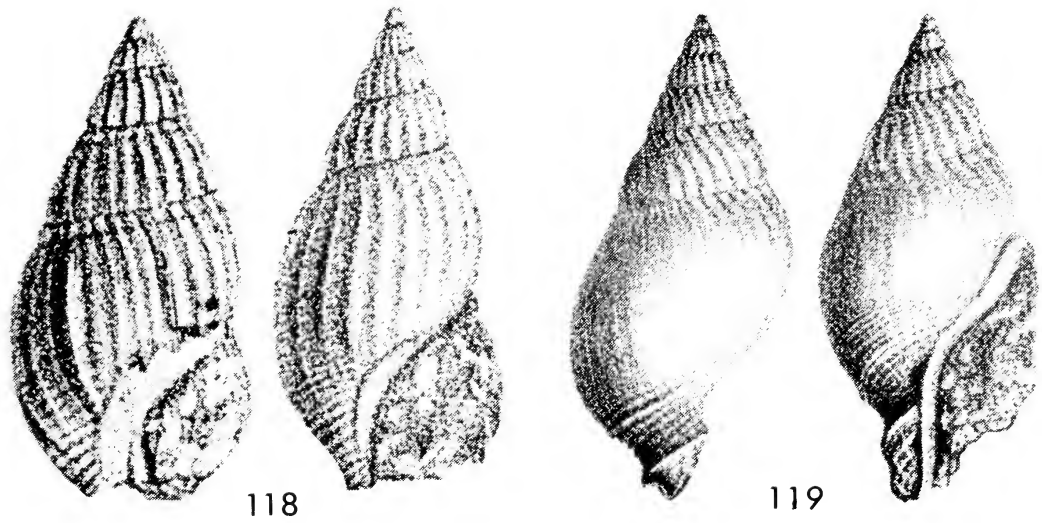
Var.b — This is distinguished by the opposite peculiarities, the spire is more elongate, the whorls less convex, the ribs slightly more flexuous and more delicate. Nevertheless the characters of the base of the body whorl remain constant in all three forms." [Translation of original description from Vredenburg 1925].

TYPE LOCALITY. Chaine d'Hala [Gáj of Sind], Miocene of India.

DISTRIBUTION. Miocene of India and Pakistan.

Type specimens. The whereabouts of the type of *N.falconeri* (d'Archiac & Haime) is not known to me.

Vredenburg (1925) compared this species to *"Nassa crenulata* Reeve" (= *Nassarius castus* Gould), *N.nodifer* (Powys), *"Nassa scalaris* A.Adams" and *"N.verbeeki* Martin" (= *Nassarius castus* Gould). The species is probably the ancestral form of *N.castus* (Gould).



Figs. 118,119. Fossil Nassariinae. 118. *Nassarius (Zeuxis) falconeri* (d'Archiac & Haime). Type-figure; 22.0 mm. 119. *N. (Z.) cautleyi* (d'Archiac & Haime). Type-figure; 27.0 mm (both from d'Archiac & Haime, 1853-54, pl.31,figs.10-13).

Nassarius (Zeuxis) cautleyi (d'Archiac & Haime, 1854)
(Fig. 119)

1850. *Buccinum reticulatum* Linnaeus, d'Archiac, Hist.progr.Geol.Soc.France 3:296 (non Linnaeus, 1758).
1854. *Buccinum cautleyi* d'Archiac & Haime, Desc.anim.foss.numm.l'Inde p.320, pl.31, figs.12,12a,13.
1924. *Nassa (Zeuxis) cautleyi* (d'Archiac & Haime), Vredenburg, Rec.Geol.Surv.India 55:74; 1925 Vredenburg, Mem.Geol.Surv.India 50:209.

"Shell fusiform, inflated in the middle, attenuated towards its extremities, consisting of eight slightly convex whorls separated by linear sutures, ornamented with numerous, feebly prominent, flexuous ribs, compressed posteriorly towards the suture, and fading away anteriorly. Equal, equidistant, linear, transverse striations are observed between the ribs. The body-whorl, the height of which is equal to that of the spire, only carries lines of growth. The concave portion of the base carries seven or eight, unequal, spiral striations followed by a sharp keel extending from the left side to the termination of the canal, succeeded by four or five more similarly disposed striations up to the columella. Columellar lip forming a thick and wide callosity from its junction with the outer lip to the recurved extremity of the canal. The outer lip is missing. Height 27.0 mm, diameter of the body whorl 13.0 mm.

Var.a — To this variety is provisionally referred a much shorter shell, with a less pointed apex, the flexuous ribs of which remain very distinct as far as the spiral striations of the base." [Translation of original description from Vredenburg 1925].

TYPE LOCALITY. Chaine d'Hala [Gáj of Sind], Miocene of India.

DISTRIBUTION. Miocene of India.

Type specimens. The whereabouts of the type of *N.cautleyi* (d'Archiac & Haime) is unknown.

Vredenburg (1925) compared *N.cautleyi* with *Nassarius falconeri* (d'Archiac & Haime), but differentiated between the canaliculate sutures of the former and linear sutures of the latter species.

Nassarius (Zeuxis) siquijorensis (A.Adams, 1852)
(Plate 25, figs.12-14; Plate 26, figs.1-5)

1822. *Buccinum canaliculatum* Lamarck, Hist.nat.anim.s.vert. 7:267 (non Gmelin, 1791).
1852. *Nassa siquijorensis* A.Adams, Proc.Zool.Soc.Lond. Pt.19:97; 1853 Reeve, Conch.Icon. 8:pl.8, figs.53a,b; 1934 Mari, J.Conchyl. 78:18.

1852. *Nassa crenellifera* A.Adams, *ibid.*, Pt.19:98; 1853 Reeve, Conch.Icon. 8:pl.8, figs.49a,b; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:42.
1877. *Nassa canaliculata* Lamarck var., Marrat, Prop.new forms genus *Nassa,* pl.1,fig.12.
1880. *Nassa cingenda* Marrat, Var.shells genus *Nassa* p.102; 1940 Tomlin, Proc.Malac.Soc.Lond. 24:35.
1900. *Nassa steindachneri* Sturany, Anz.k.Akad.Wiss.math.-nat.Classe Wien 17:199; 1903 Sturany, Denk.k.Akad.Wiss.math.-nat.Classe Wien 74:222, pl.2, figs.9a-c.
1908. *Nassa* sp. Hirase, Conch.Mag.Kyoto 2:148, pl.29,fig.75.
1931. *? Nassa (Zeuxis) canaliculata* subsp. *teschi* Koperberg, Jaarb.Mijnw.Ned.-Indie Lief.7:108.
1931. *? Nassa (Hinia) siquijorensis* subsp. *marinuensis* Koperberg, *ibid.,* Lief.7:110.
1931. *? Nassa (Hinia) siquijorensis* subsp. *timorensis* Koperberg, *ibid.,* Lief.7:110.
1952. *Nassarius hirasei* Kuroda & Habe, Check-List & Bibl.Rec.mar.shells Japan p.70 (nom.subst.pro *Nassa* sp. Hirase, 1908).
1961. *Zeuxis hirasei* (Kuroda & Habe), Habe, Col.illust.shells Japan 2:App. p.24, pl.32,fig.26.
1966. *Zeuxis dorsatus* (Roeding), Habe & Kosuge, Shells world col. 2:63, pl.22,fig.40 (non *Buccinum dorsatum* Roeding, 1798 = *Nassarius*).
1969. *Nassarius (Tarazeuxis) dorsatus* (Roeding), Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19(1):137, pl.12,figs.1-4 (non *Buccinum dorsatum* Roeding, 1798 = *Nassarius*).
1972. *Nassarius (Zeuxis) dorsatus* (Roeding) *[pars]* Cernohorsky, Rec.Auckland Inst.Mus. 9:168,figs.117,118 only (figd.syntypes of *Buccinum canaliculatum* Lamarck, 1822).

Shell up to 43.0 mm in length, elongate-ovate to almost ovate, spire produced, teleoconch of 6-8½ convex whorls, protoconch of 3¼-3½ glassy, carinate embryonic whorls, upper spire whorls occasionally angulate, sutures usually prominently canaliculate, some individuals with only weakly channelled sutures; sculptured with numerous, slender and occasionally slightly oblique axial ribs which either continue to the back of the outer lip or become obsolete on the last 1-2 whorls; axial ribs, when present, number from 30-50 on the body whorl and from 34-52 on the penultimate whorl; spiral sculpture consists of very fine spiral threads which are either confined to the interspaces or weakly override axial ribs, and number from 5-9 on the penultimate and from 0-14 on the body whorl, apart from 6-8 slightly nodulose cords at the base and 4-7 oblique cords on the siphonal fasciole, sutural nodules well defined in ribbed specimens or with only a subsutural groove in smooth individuals, spiral sculpture occasionally obsolete. Aperture moderately narrow, outer lip thickened and variced, interior with 11-18 lirate denticles, edge of outer lip either simple or with up to 18 small spinose denticles, columellar callus moderately narrow but occasionally flaring over siphonal fasciole and thinning above parietal wall, columella with 5-15 small denticles or wrinkles, siphonal notch and anal canal prominent. Cream, grey, fawn or light brown in colour, some specimens with 1-3 faint or distinct brown bands on body whorl, bands frequently only visible as short brown bands on the dorsal side of the body whorl, columellar callus white, interior of aperture greyish-brown, denticles paler.

TYPE LOCALITY. Siquijor I, Philippines *(siquijorensis)*; none *(canaliculatum* Lamarck; *crenellifera*; *cingenda)*; near Lith, Red Sea, 39°29'E & 19°57'N, 430 m *(steindachneri)*; Timor, Pliocene of Indonesia *(teschi)*; Niki Niki, Timor, Pliocene of Indonesia *(marinuensis)*; Toi Oesapi Soka, Timor, Pliocene of Indonesia *(timorensis)*; off Isshiki, Aicho Prefecture, Honshu, Enshu-nada, Japan, 200-300 m *(hirasei)*.

DISTRIBUTION. From the Red Sea to India, Mauritius, Japan and New Caledonia. In sand, subtidal to a depth of 450 m.

Type specimens. Three syntypes of *N.siquijorensis* (A.Adams), are in the British Museum (N.H.), London, No.1973118, and the specimen measuring length 24.0 mm, width 11.6 mm, is here selected as the lectotype (pl.25, fig.12). The holotype of *Nassa crenellifera* A.Adams, is in the same Institution, No.197329, length 19.3 mm, width 10.3 mm, and the holotype of *N.cingenda* Marrat, is in the Merseyside County Museum, Liverpool, length 30.0 mm, width 15.5 mm. The holotype of *Nassarius hirasei* Kuroda & Habe, is in the National Science Museum, Tokyo, No.48261, length 25.5 mm, width 14.8 mm, and syntypes of *Buccinum canaliculatum* Lamarck, are in the Museum d'Histoire Naturelle, Geneva, No.1101/96, length 36.4 mm and 35.0 mm respectively. The types of *N.teschi* Koperberg, *N.marinuensis* Koperberg, and *N.timorensis* Koperberg, are probably in the Geology Department, University of Amsterdam, and the types of *N.steindachneri* Sturany, can no longer be found in the Natural History Museum, Vienna (Dr. E.Wawra, *in litt.*).

Material examined. RED SEA: opposite marine laboratory, Eilat, Gulf of Aqaba, 400-450 m (TAU); EAST AFRICA: S. point of Grand Recif, Comoro Is, 400 m (MNHNP); MAURITIUS: (AMS); INDIA: Karvar (USNM); Madras (AMS); SRI LANKA: (USNM); N. coast of Sri Lanka (AMS);j THAILAND: Koh Kong, 18-27 m; Koh Kut, 27 m (both ZMC); W. coast of Tarutao I, Satun, 12 m (PMBC); Phuket town, Phuket (coll.Richardson); MALAYSIA: Batu Ferringhi, Penang; Pulau Langkawi, Kedah (both coll.McCausland); INDONESIA: Pruput, Bantam; Keledjitan, Bantam, Java; S. of Dodepo I, Gulf of Tomini, Celebes; S.E. of Tikola, Buton Str., Celebes,

68 m (all USNM); Lampong Bay, 5°42'S & 103°17'E, 29 m (ZMC); Labuan, Sarawak, Borneo (coll.Richardson); PHILIPPINES: off Adyagan I, E.Masbate, 247m; N. of Dumurug Pt., Masbate, 249 m; off Sibugay I, E. of Masbate, 198 m at 15.5°C; Tintag I; Malampaya, Palawan group, 13 m; Cebu City; Lama, Zamboanga; Manila Harbour; Mindanao; Santa Cruz I, Zamboanga; N. of Corregidor, 68 m; Daram Channel, W. Samar, 48 m; Juijulugan; off Jolo, 37 m; Leyte; off Ptago, Luzon (all USNM); Tayabas Bay; Punta Engano, Mactan I, Cebu (both coll.Dan); Ligtang, Rosario, Carite, S.tip of Manila Bay (coll.Deynzer); off Batangas, 14°27'N & 120°41.5'E, 36-37 m (MNHNP); CHINA: Amoy; Hongkong, 7-22 m; Foochow; Yenking, Checkiang Province; off Pratas I, 124 m (all USNM); Lamma I, Hongkong; off Wong Chuk Kok, 33-40 m; Cheng Chow I; Lantow I; Aberdeen, all Hongkong (all AMS); RYUKYU IS: Buckner's Bay, Okinawa (coll.Choslen); JAPAN: Mikawa, 92 m (USNM); NEW CALEDONIA: Poindimie (AMS); S. Point of Great reef, 400 m (MNHNP).

This species can be separated from *N.castus* (Gould) on features of more acuminate spire, canaliculate sutures and considerably more numerous axial ribs (0-27 in *castus* and 0-52 in *siquijorensis* on the penultimate whorl).

The typical form *siquijorensis* A.Adams, is the form with prominent axial ribs all the way to the back of the outer lip. *N.cingenda* Marrat and *N.crenellifera* A.Adams, also belong to this form, except that in the latter the axial ribs are finer and even more numerous. The form *hirasei* Kuroda & Habe, is also fully ribbed but is squatter, with the body whorl more inflated.

In the form *canaliculata* Lamarck (a primary homonym), the last 1-3 whorls are almost smooth except for a few basal striae and occasionally a subsutural groove or spiral thread. It is this form which has been confused with *Nassarius dorsatus* (Roeding), a species endemic to Northern Australia, and easily separable on shell-features from *N.siquijorensis*.

Nassarius (Zeuxis) scalaris (A.Adams, 1852) [nom. praeocc.]
(Plate 26, figs.6,7)

1816. *Nassa crenulata* Lamarck, Tabl.Encycl.Meth. p.1,pl.394, fig.6 (non *Buccinum crenulatum* Bruguière, 1789 = *Nassarius*).
1825. *Buccinum turris* Wood, Index Testac. p.115, pl.24,fig.165; 1856 Hanley in Wood, Index Testac. p.121, pl.24,fig.165 (non Wood, 1818).
1852. *Nassa scalaris* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108; 1853 Reeve, Conch.Icon. 8:pl.4,fig.21; 1934 Mari, J.Conchyl. 78:18 (non Borson, 1825).
1955. *Nassa (Alectryon) scalaris* Adams, Marche-Marchad, J.Conchyl. 95(1):36.

Shell up to 27.0 mm in length, elongate-ovate, spire produced, teleoconch of 6¼-7¼ convex whorls, protoconch of 3¼-3½ glassy, brown-banded, carinate embryonic whorls, sutures either canaliculate or only ledged, first post-embryonic whorl triangulate; sculptured with slender, regular axial riblets which number from 13-23 on the penultimate and from 15-21 on the body whorl; spiral sculpture consists of spiral threads which override axial ribs on spire whorls but are confined to interspaces on body whorl, axial ribs on spire whorls nodulose, spiral striae numbering from 5-8 on the penultimate and from 8-14 on the body whorl, followed by 6-8 nodulose cords and 4-9 oblique cords on the siphonal fasciole. Aperture moderately open, outer lip thickened but not strongly variced and with 12-17 lirate denticles, edge of outer lip with up to 20 minute spinose denticles, lower half of columella laminate and with 5-12 denticles, columellar callus thinning above parietal wall, siphonal notch and anal canal prominent, parietal denticle perpendicular in type and specimens examined. Steel-grey in colour, body whorl, particularly the dorsal side, with 2 brown bands, columellar callus and edge of aperture white, deep interior greyish-brown. Operculum brown and serrate at margin.

TYPE LOCALITY. Corrigidor I, Philippines, 13 m *(scalaris)*; none *(crenulata* Lamarck); Guinea = error! (*turris* Wood).

DISTRIBUTION. From Indonesia to the Philippines and the New Hebrides. In sand, subtidal.

Type specimens. Three syntypes of *N.scalaris* (A.Adams), are in the British Museum (N.H.), London, No.1973152, and the specimen measuring length 26.2 mm, width 13.0 mm, is here selected as the lectotype (pl.26, fig.6). The whereabouts of the types of *Nassa crenulata* Lamarck, and *Buccinum turris* Wood, is unknown.

Material examined. INDONESIA: Tanjong Lobang, Sarawak, Borneo (coll.Richardson); PHILIPPINES: Corregidor I (BMNH); NEW HEBRIDES: Efate I (coll.Lepage).

This species is only tentatively listed as valid. I have seen only 7 specimens all of which differed from *N.siquijorensis* (A.Adams) by features of acuminate spire, triangulate first post-embryonic whorl, fewer axial ribs and more prominent spiral sculpture. All available taxa are homonyms and therefore not available, but no substitute name is proposed until more material for study will be available.

Nassarius (Zeuxis) glagahensis Oostingh, 1935
(Fig. 120)

1935. *Nassarius (Zeuxis) glagahensis* Oostingh, Weten.Meded.Mijnb.Ned.-Indie No.26:75, pl.7,figs.77a-c, fig.78.

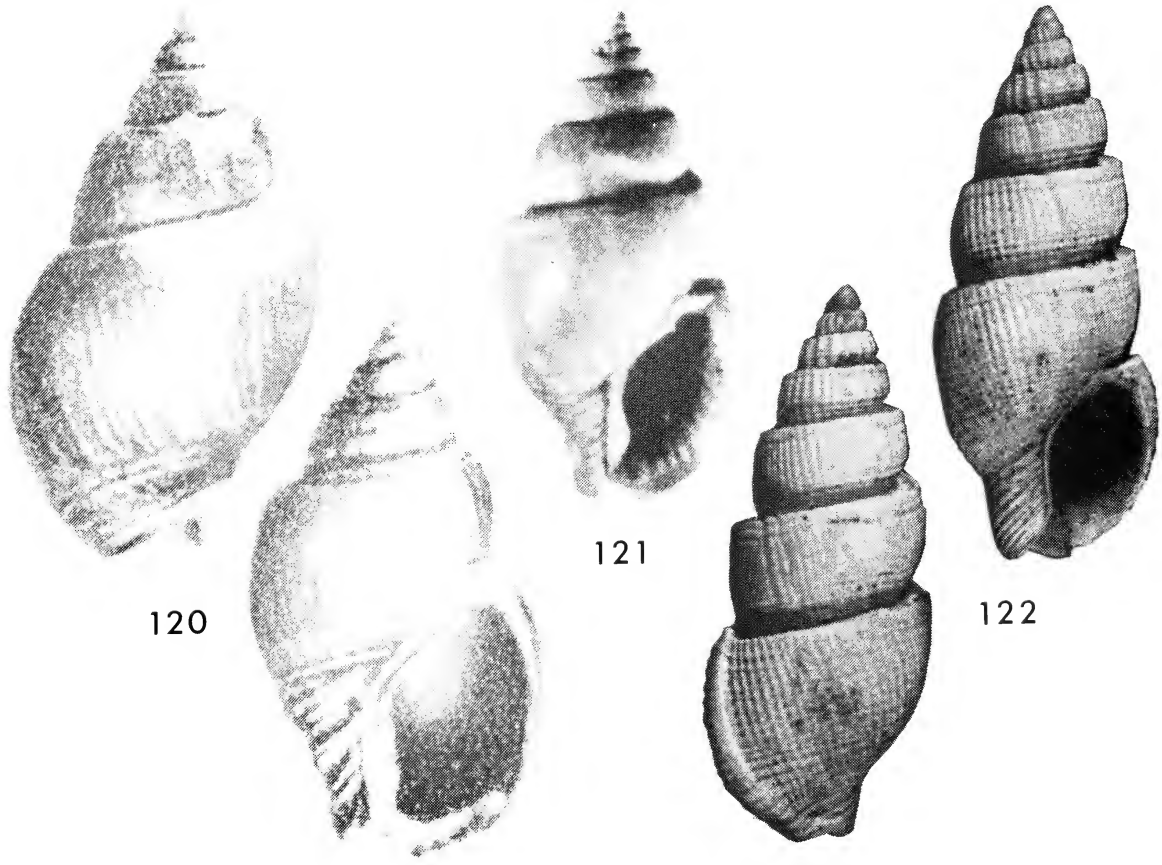
The complete shell is smooth and shining, *c.*13.0 mm in length, post-embryonic whorls with a weak, irregular somewhat curved axial sculpture, later whorls with only axial growth-striae; sutures not deep but broadly canaliculate; spiral sculpture continues where axial sculpture ceased and consists of a subsutural cord which persists all the way to the back of the outer lip, subsutural cord occasionally paired, lower third of body whorl and siphonal fasciole prominently corded. Aperture ovate, anal canal weakly indicated, outer lip broadly varicose but not thick, aperture with 12-13 lirate denticles, anterior edge of outer lip with 5 minute denticles; columella narrowly calloused, anterior of columella with a few denticles, posterior with a weak parietal fold, siphonal canal prominent. [Free abridged translation].

TYPE LOCALITY. St.166, Kali Bioek, Boemiajoe, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type of *N.glagahensis* Oostingh, is probably in the Museum of Bandoeng, Indonesia. The original dimensions cited for the type specimen were length 12.5 mm, width 6.7 mm.

Oostingh (1935) compared *N.glagahensis* to *N.venemai* (Koperberg), but the latter was said to differ because it had axial ribs and 4 spiral threads on the central whorls and lacked the continuous subsutural thread. *N.glagahensis* is closely similar to the *"canaliculata"* form of *N.siquijorensis* (A.Adams).



Figs. 120-122. Fossil Nassariinae. 120. *Nassarius (Zeuxis) glagahensis* Oostingh. Type-figure; 12.5 mm (from Oostingh, 1935, pl.7,fig.77). 121. *N. (Z.) venemai* Koperberg. Type-figure; 19.6 mm (from Koperberg, 1931, pl.3, fig.43). 122. *N. (Z.) bolangoi* (Ladd). Holotype USNM-214343; 14.1 mm.

Nassarius (Zeuxis) venemai (Koperberg, 1931)
(Fig. 121)

1931. *Nassa (Zeuxis) venemai* Koperberg, Jaarb.Mijnw.Ned.-Indie Lief.7:107, pl.3,fig.43.

Shell slender, *c.* 20.0 mm in length, with 9½ weakly convex whorls inclusive of protoconch which is bluntly conoidal, polygyrate and carinate on the third whorl, sutures canaliculate, presutural ramp angulate, post-embryonic whorls with fine and later slightly broader axial ribs and 4 bisecting spiral threads, sculpture becoming obsolete on later whorls except for 5 spiral cords at base of body whorl and oblique cords on the siphonal fasciole. Aperture ovate, outer lip only slightly varicose and with 12 lirate denticles within, columella narrowly calloused, laminate anteriorly and with 5 denticles, parietal denticle distinct, siphonal notch and anal canal prominent. [Free translation].

TYPE LOCALITY. Toi Oesapi Soka, Timor, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type of *N. venemai* (Koperberg) is probably in the Geology Department, University of Amsterdam. The original dimensions were length 19.6 mm, width 10.0 mm.

This is yet another species which closely resembles the smooth, canaliculate form of *N.siquijorensis* (A.Adams).

Nassarius (Zeuxis) bolangoi (Ladd, 1976)
(Fig. 122)

1976. *Bathynassa bolangoi* Ladd, Nautilus 90(4):133, figs.34-40.

Shell up to 14.0 mm in length, slender elongate-ovate, teleoconch of 6 weakly convex whorls which are constricted anteriorly, protoconch of 3 glassy, finely carinate embryonic whorls, sutures strongly canaliculate; post-embryonic whorls with axial ribs which become thinner and considerably more numerous on later whorls, axial sculpture continues on to concave sutural ledge, base of shell with 5-6 stronger cords, siphonal fasciole with 7-8 oblique cords; spiral sculpture consists of numerous, fine, close-set spiral threads which produce a net-like pattern on the body whorl and also override the varix. Aperture small and shorter than the spire, outer lip with a prominent varix, interior with 11 short denticles, columella with a very narrow, bordered callus, smooth, apart from a weak parietal denticle, siphonal notch distinct, anal canal weak.

TYPE LOCALITY. Navaka River beds, Santo I, Pleistocene of New Hebrides.

DISTRIBUTION. Pleistocene of the New Hebrides.

Type specimens. The holotype of *N.bolangoi* (Ladd), is in the National Museum of Natural History, Washington, No. USNM-214343, length 14.1 mm, width 5.6 mm.

Nassarius (Zeuxis) bicallosus (E.A.Smith, 1876)
(Plate 26, figs.8-11)

1876. *Nassa bicallosa* E.A.Smith, J.Linn. Soc.Lond. 12:543, pl.30,fig.1; 1959 Barnard, Ann.Sth.African Mus. 45:107,fig.22h (radula), fig.23d (protoconch); 1973 Kensley, Sea-shells Sth. Africa p.160, fig.588.
1877. *Nassa glabella* Marrat, Prop.new forms genus *Nassa*, p.3,pl.1,fig.7.
1877. *Nassa laevigata* Marrat, *ibid.*, p.3 (nom.subst.pro *N.glabella* Marrat, 1877) [non *N.laevigata* Pusch, 1837].
1916. *Arcularia bicallosa* Smith, Hedley, J.R.Soc.West Australia 1:61.
1928. *Nassarius bicallosus* (Smith), Tomlin, Ann.Sth. African Mus. 25(2):314; 1982 Kaicher, Card cat.world-wide shells, Pack No.31:card 3150.
1969. *Nassarius (Nassarius) coronatus philippinensis* Shuto, Mem.Fac.Sci. Kyushu Univ. (D), Geol. 19(1):130, pl.12,figs.5-7, textfig.28.
1972. *Nassarius (Zeuxis) bicallosus* (E.A.Smith), Cernohorsky, Rec.Auckland Inst.Mus. 9:170,fig.99 (radula), figs.119,120 (shell).

Shell up to 28.0 mm in length, almost ovate, body whorl occasionally inflated, teleoconch of 6-7¼ convex whorls, protoconch of 3-3¼ glassy, embryonic whorls, last whorl finely carinate but most specimens worn smooth, sutures on spire whorls tight, body whorl suture narrowly ledged or slightly canaliculate, especially on the dorsal side; post-embryonic whorls sculptured with axial riblets and a row of sutural nodules, last 4-4½ whorls with only a sub-sutural groove and short axial riblets or nodes at sutures, subsutural groove obsolete on body whorl; sutural nodes are larger on the body whorl than on spire whorls and number from 10-30 on the penultimate and from 8-17 on the body whorl, in some individuals, however, sutural nodes may become obsolete. Aperture moderately narrow, outer lip thickened and prominently variced, interior with 11-17 lirate denticles, edge of outer lip bordering anal canal frequently with a spur, anterior edge of outer lip with a few small denticles; columella narrowly calloused and almost fused to the body whorl, prominently concave, anterior recurved towards aperture and sometimes with a blunt, spurlike protrusion, columella with 9-13 aligned

denticles which are positioned on a rim, siphonal notch and anal canal prominent. Fawn or bluish-grey in colour, ornamented with darker, underlying bands, interspaces of sutural nodules on body whorl occasionally darker, some specimens uniformly reddish-brown, columella white to cream, interior of aperture usually ringed or stained with purple-brown. Operculum brown and either simple, serrate or irregularly jagged at margins.

TYPE LOCALITY. West Australia; Swan River; Cape Natal, Sth. Africa (the locality indication on label accompanying the syntypes of *N.bicallosus* reads "Cape Natal"); none (*laevigata* Marrat and *glabella*); Santa Barbara silt, Panay I, Plio/Pleistocene of the Philippines *(philippinensis)*.

DISTRIBUTION. From South Africa to India, the Philippines and Northern Australia. On sand-bars, in sand and mud, usually subtidal to a depth of 100 m.

Type specimens. Three syntypes of *N.bicallosus* (E.A.Smith), are in the British Museum (N.H.), London, No.1876.1.10.29, and the specimen measuring length 21.3 mm, width 11.8 mm, is here selected as the lectotype (pl.26, fig.8). The holotype of *Nassa laevigata* Marrat, is in the Merseyside County Museum, Liverpool, length 20.4 mm, width 11.0 mm. There are also numerous syntypes of *N.glabella* Marrat, in the same Institution, and the specimen measuring length 24.6 mm, width 13.4 mm, is here designated as the lectotype (pl.26, fig.9). The holotype of *Nassarius philippinensis* Shuto, is in the Geology Department, Kyushu University, No.GK-L 7409, length 17.3 mm.

Material examined. SOUTH AFRICA: Cape Natal (BMNH); INDIA: Madras (ZSI); INDONESIA: N. of Bali, 7°34'S & 114°18'E, 100 m (ZMC); Lampong Bay, 5°38'S & 105°17'E, 25 m; Kai-Oerne, Kai Is (all ZMC); PHILIPPINES: Bohol I (ZMC); AUSTRALIA: Western Australia: Broome; Yampi Sound; 3 km E of jetty, Broome (all AIM); Entrance Pt., Broome (USNM); Weld I; Broome, 16 m; Pardoo; Vansittart Bay (all AMS); Onslow; Willy Creek, Broome; Roebuck Bay (all NMV); Dampier Archipelago; near Yardie Creek, W. side of Northwest Cape (both coll.Hansen; Northern Territory: Darwin; Camp Pt., Melville I, N. of Darwin (both AMS); Queensland: Caloundra (coll.Powell); Magnetic I (AIM); Yule Pt., N. of Cairns (coll.Whitehead); Gt.Keppel I (coll.Gardner); Somerset Bay, Cape York Peninsula; Friday I, Torres Str. (both AMS).

The species is superficially similar to the canaliculate form of *N.siquijorensis* (A.Adams), but it lacks the numerous fine axial riblets and prominently canaliculate sutures, and has a distinctive sculpture of sutural nodes, columellar denticles which are set in line on an elevated rim, and a strong varix on the back of the outer lip.

Nassarius (Zeuxis) algidus (Reeve, 1853)
(Plate 26, figs.12,13)

1853. *Nassa algida* Reeve, Conch.Icon. 8:pl.22, figs.145a,b.
1886. *Nassa (Zeuxis) algida* Reeve, Watson, Rept.Sci.Res.Voy.H.M.S."Challenger", 15:180.
1886. *Nassa (Zeuxis) algida* var. *chlora* Watson *ibid.*, 15:181.

Shell up to 25.0 mm in length, elongate-ovate, light in weight, teleoconch of 6½-7¼ convex whorls, protoconch of 1½-2 glassy, non-carinate embryonic whorls, sutures narrowly ledged; post-embryonic whorls sculptured with moderately thick, angulate and slightly slanting axial ribs, a subsutural groove which separates sutural nodules and a few weak spiral striae in the interspaces; axial ribs become obsolete towards the anterior suture on later whorls and on the last two whorls only remnants of axial ribs remain in the form of irregular, axially oriented sutural nodes, and occasionally an additional subsutural groove; base of body whorl with 3-6 cords, siphonal fasciole with 5-7 cords, 2-3 axial ribs are crowded on the back of the outer lip. Aperture narrow, outer lip thickened and moderately varied, interior with 7-12 lirate denticles, anterior edge of outer lip occasionally with small spinose denticles, lower half of columella calloused and laminate, parietal wall only glazed, columella with 7-9 denticles, siphonal notch and anal canal distinct. White in colour, ornamented with reddish-brown axial streaks which are interrupted by a single white band on spire whorls and 2 such bands on the body whorl, forming 3 rows of quadrate spots, varix and columellar callus white, interior of aperture banded with orange-brown. Operculum yellowish-brown and simple at margins.

TYPE LOCALITY. Moreton Bay, Queensland, Australia *(algidus)*; off Albany I, Cape York, Torres Strait, Australia, 5-22 m *(chlora)*.

DISTRIBUTION. From Western Australia to North Australia and southern Queensland, Australia. On sand-bars, from the intertidal zone to a depth of 22 m.

Type specimens. Three syntypes of *N.algidus* (Reeve) are in the British Museum (N.H.), London, No.197314, and the specimen measuring length 23.2 mm, width 12.5 mm, which is holed on the ventral side of the body whorl, is here selected as the lectotype (pl.26, fig.12). The type of *Nassa chlora* Watson, has not been located at the British Museum (N.H.).

Material examined. AUSTRALIA: West Australia: near Yardie Creek, W. side of N.W. Cape (coll.Hansen); Queensland: Swains reef (coll.Nielsen); Urangan (coll.Langner); Moreton Bay (BMNH).

The species has been erroneously reported from Natal, South Africa, on several occasions, and Barnard (1959) suggested that the species *N.algidus* be deleted from South African faunal lists. The South African species has been recently described as *N.glans fenwicki* Kilburn, 1972.

The species is similar to *N.comptus* (A.Adams) and *N.bicallosus* (E.A.Smith), but the former species is never nodulose at the sutures and both species have a multispiral protoconch of about 3 whorls whereas *N.algidus* has a paucispiral one of only 1¾-2 whorls.

Nassarius (Zeuxis) barsdelli Ladd, 1976
(Plate 27, figs. 1-3)

1976. *Nassarius (Alectrion) barsdelli* Ladd, Nautilus 90(4):131, figs.12-15
1981. *Nassarius barsdelli* Ladd, Cernohorsky, Rec.Auckland Inst. Mus. 18:197, figs.11,12 (figd. holotype).

Shell up to 30.0 mm in length, broad, sometimes rotund, solid, teleoconch of 6-6½ weakly convex whorls, protoconch of 3-3¼ glassy, finely carinate embryonic whorls, sutures narrowly canaliculate; post embryonic whorls with axial riblets and fine spiral striae which either override axials or are confined to interspaces, last 3-4 whorls usually smooth apart from 5-6 spiral cords at base and 4-6 cords on the siphonal fasciole, some individuals with a fine but often obsolete subsutural groove, other individuals with spiral grooves on the dorsal side of body whorl, sutures irregularly undulate or weakly crenulate. Outer lip thick but not variced, interior with 10-15 lirae which extend into aperture, anterior edge of outer lip with some minute spinose denticles, columellar callus narrow and bordered, prominently concave and with 10-14 denticles or wrinkles, siphonal notch prominent, anal canal deep and almost 'U'-shaped. Fawn to light tan in colour, body whorl with 2 darker, nebulous bands on body whorl, sutures sometimes with orange-brown and white spots, some individuals streaked with orange-brown and pale zones, columellar callus white, interior of aperture brown, lirae white.

TYPE LOCALITY. St.USGS-25715, Kere River, Santo I, Pleistocene of the New Hebrides.

DISTRIBUTION. From the Philippines to the New Hebrides. Subtidal, to a depth of 180 m.

Type specimens. The juvenile holotype of *N. barsdelli* Ladd, is in the National Museum of Natural History, Washington, No. USNM-214274, length 23.8 mm, width 14.7 mm.

Material examined. PHILIPPINES: off Manila Bay, 13°53'N & 120°09'E, 134 m; 13°46'N & 120°24'E, 100-180 m; 14°12'N & 120°29'E, 122-127 m, and 14°16'N & 120°32'E, 70-76 m (all MNHNP).

Fossil record. PLEISTOCENE: Kere River, Santo I, New Hebrides (USNM; coll. Buckeridge; coll.Barsdell).

The original description of *N. barsdelli* has been based on a series of about 40 juvenile specimens but not a single adult individual. Cernohorsky (1981b) re-described the species on the basis of adult individuals from the type locality. The record from the Philippines is the only record of living specimens outside the New Hebrides, but it is highly probable that the species still lives in deeper water in the New Hebrides and other areas.

The species can be separated from *N.bicallosus* (E.A.Smith) on features of more rotund shape, longer body whorl, non-nodose sutures, different columellar denticles, and the very long lirae which extend into the aperture in *N. barsdelli.*

Nassarius ((Zeuxis) acuminatus (Marrat, 1880)
(Plate 27, figs. 4-6)

1880. *Nassa acuminata* Marrat, Var.shells genus *Nassa* p. 78; 1938 Tomlin, J. Conch. 21:83.
1911. *Nassa (Alectryon) elegantula* Schepman, Siboga Exped. 49d:315, pl.19, figs 11a,b.
1966. *Zeuxis scalaris* A. Adams, Habe & Kosuge, Shells world col. 2:62, pl.22, fig.35 (non *Nassa scalaris* A. Adams, 1852 = *Nassarius*).

Shell up to 32.0 mm in length, slender elongate-ovate, shining, teleoconch of 6-7 convex whorls which are angulate on presutural ramp, protoconch of 3-3¼ glassy-fawn, finely carinate embryonic whorls, sutures narrowly canaliculate: sculptured with slender axial riblets which may continue to the body whorl or become obsolete after 2-3 post embryonic turns; in fully ribbed specimens the central area of the dorsal side of the body whorl is always smooth and is followed by 4-6 crowded ribs on the back of the outer lip; the majority of specimens, however, are smooth on the body whorl, but prominent sutural nodes and feeble axial ribs are in evidence on the penultimate whorl; axial ribs number from 0-25 on the penultimate and from 0-16 on the body whorl; post-embryonic whorls are sculptured with 4-5 spiral striae which render axial ribs nodulose, spiral sculpture disappears on later whorls with the exception of a weak subsutural spiral groove, 7-8 basal cords and 4-5 cords on the siphonal fasciole. Aperture moderately narrow, oviform, outer lip thickened but not varicose, interior

with 12-18 denticles, anterior edge of outer lip with a few spinose denticles, columellar callus narrow and usually thinner above parietal wall, columella closely denticulate and wrinkled along its entire length, siphonal notch and anal canal prominent. Shining fawn to light brown in colour, ornamented with 2 narrow, nebulous dark brown bands on the dorsal side of the body whorl, columellar callus and aperture white, interior occasionally brown. Operculum brown, margins serrate or with only 1 denticle on either side.

TYPE LOCALITY. None *(acuminatus)*; Madura Strait, Indonesia, 56 m *(elegantula)*. Makassar Straits, Indonesia, is here designated as the type locality (specimens in ZMC and MNHNP).

DISTRIBUTION. From India to China and North Australia. In sand, mud, muddy clay and shell-debris, subtidal to a depth of 340 m.

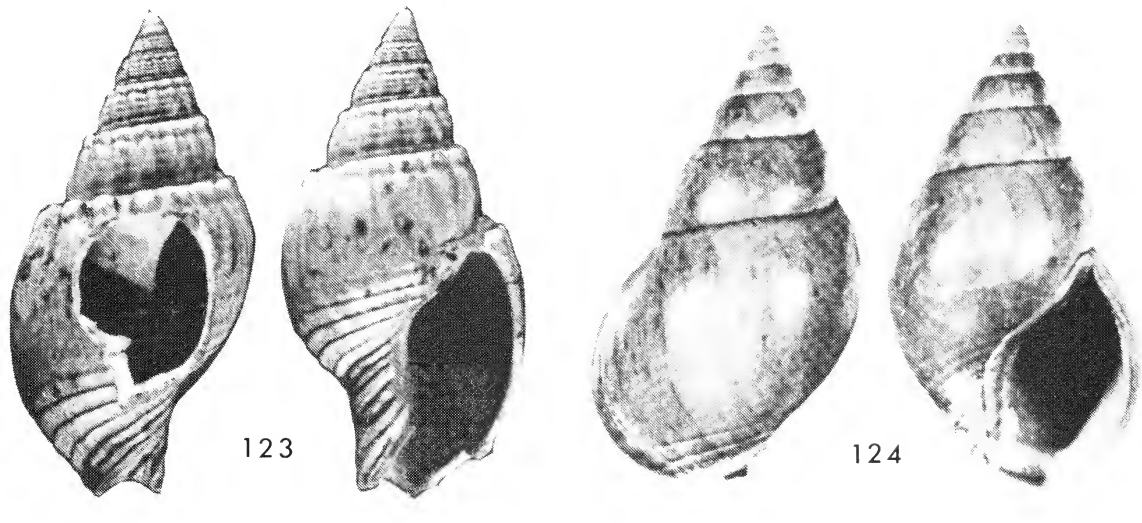
Type specimens. The holotype of *N. acuminatus* (Marrat), is in the Merseyside County Museum, Liverpool, length 29.7 mm, width 14.0 mm. Several syntypes of *Nassa elegantula* Schepman, are in the Zoological Museum, University of Amsterdam, and the specimen which appears to be the one originally illustrated, dimensions length 24.3 mm, width 12.7 mm, is here selected as the lectotype (pl. 27, fig. 6).

Material examined. INDIA: Bay of Bengal, 20°37'N & 87°33'E, 68m (ZMC); THAILAND: near Chance I, 9°11'36"N & 97°59'24";E, 50 m; Gulf of Thailand, 10°11'N & 101°37'E, 72 m (both ZMC); INDONESIA: between Sumatra and Java, 5°22'S & 105°44'E, 30 m; Amboina Bay, 92 m; N. of Bali, 8°26'S & 114°29'E, 70 m; Macassar Str., 1°25'S & 117°05'E, 50m; Java, 8°26'S & 114°29'E, 70 m (all ZMC); Jamdena Strs., E. of Wotap I, Tanimbar, 64-73 m; Teluk Dodinga, near Ternate, Halmahera, 46-62 m; 11-19 km W. of Toba I, N. end of Aru I, 64 m (all WAM); Makassar, 1°27'S & 117°02'E, 51-54 m; 1°09'S & 117°08'E, 25 m; 1°08'S & 117°18'E, 49 m (all MNHNP); PHILIPPINES: 26 km N.E. of Port Banga, Mindanao, 73 m; 10 km off Port Banga, Mindanao, 49 m (both ZMC); off Pitage, Luzon; Daram Channel, W. Samar, 48 m; N. of Marinduque, 92 m; off-Tayabao, Luzon, 165 m; Subic Bay, Luzon, 60 m; off Badian, I, W.Samar, 60 m; E. of Siquijor; off Polloc, Mindanao, 51 m; off San Fernando, Luzon, 340 m (all USNM); Batangas; Punta Engano, Mactan I, Cebu (both coll. Dan); CHINA: N.W. of Pratas I, China Sea, 62 m (USNM); off Hong Kong (AMS; USNM); PAPUA NEW GUINEA: Laing I, Hansa Bay, 35 m (coll. Tursch); AUSTRALIA: Northern Territory: 91 km N. of Croker I, 10°15'S 132°54'E, 70 m; Arafura Sea, N. of Croker I, 10°17'S & 132°38'E, 65 m and 9°30'S & 131°51'E, 146 m (all AMS).

Nassarius (Zeuxis) tambacanus (K. Martin, 1884)
(Fig. 123)

1884. *Nassa (Zaphon) tambacana* K. Martin, Samml. geol.Reichs-Mus. Leiden, (1), 3:124, pl.7,fig.127

TYPE LOCALITY. Tambak Batoe [=Tambak-watoe], Java, Upper Miocene of Indonesia.
DISTRIBUTION. Miocene of Indonesia.



Figs. 123,124. Fossil Nassariinae. 123. *Nassarius (Zeuxis) tambacanus* (K.Martin). Lectotype Rijksmuseum van Geologie en Mineralogie, Leiden, RGM-9513; 13.6 mm. 124. *N. (Z.) amycliformis* (Shuto). Type-figure; 11.9 mm (after Shuto, 1969, pl.14,figs.6,10).

Type specimens. Four juvenile, damaged syntypes of *N. tambacanus* (K. Martin), are in the Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9513, and the specimen measuring length 13.6 mm, width 6.8 mm, with a holed dorsal side of body whorl, is here selected as the lectotype (Fig.123).

No useful purpose would be served by a description of these juvenile specimens whose diagnostic characters differ widely from those of adult individuals. Altena (1948) suggested that Martin's *N. tambacanus* has been based on juvenile examples of *"Nassa elegantula* Schepman" (= *Nassarius acuminatus* Marrat). *N. tambacanus* certainly does resemble *N. acuminatus,* but at the same time it also closely resembles juvenile specimens of *N. castus* (Gould). Until juveniles will be found in company of adult individuals of the species, *N.tambacanus* is considered to be a *nomen inquirendum.*

Nassarius (Zeuxis) margaritifer (Dunker, 1847)
(Plate 27, figs. 7,8)

1833. *Buccinum reticulatum* Quoy & Gaimard, Voy.l'Astrolabe, Zool. 2:444, pl.32,figs.16,17 (non Linnaeus, 1758).
1847. *Buccinum margaritiferum* Dunker, Zeit.f.Malakozool. 4:60; 1849 Philippi, Abb. Beschr. Conchyl. 3:47, pl.1,fig.12.
1853. *Nassa (Tritia) costellifera* A. Adams, Proc.Zool.Soc.Lond. Pt.19:113.
1853. *Nassa costellifera* A. Adams, Reeve, Conch.Icon. 8:pl.9,figs.58a,b; 1868 Pease, Americ.J.Conch. 4:108; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:42.
1854. *Nassa quoyii* Rousseau, Voy.Pole Sud 5:79, pl. 21,figs.20-22.
1879. *Nassa margaritifera* Dunker, E.A.Smith, Proc.Zool. Soc. Lond. p.808; 1889 Morlet, J. Conchyl. 37.135; 1903 E.A.Smith. Proc.Malac.Soc.Lond. 5:373; 1934 Mari, J. Conchyl. 78:22.
1897. *Nassa (Niotha) margaritifera* Dunker, Melvill & Sykes, Proc. Malac.Soc.Lond. 2:169; 1911 Schepman, Siboga-Exped. 49d:327.
1930. *Nassarius (Niotha) margaritiferus* (Dunker), Bisacchi, Ann.,us.Civ.Stor. Nat. Genova 55:51.
1934. *Nassa margaritifera* var. *costellifera* A. Adams, Mari, J. Conchyl. 78:22.
1942. *Niotha margaritifera* (Dunker), Yen, Proc. Malac.Soc.Lond. 24:233.
1957. *Nassarius crenelliferus* (A.Ad.), Demond, Pacific Science 11:319, text fig.30 (non *Nassa crenellifera* A. Adams, 1852).
1957. *Nassarius crematus* Hinds, Kaicher, Indo-Pacific Sea shells pl.7, fig.20 (non *Nassa cremata* Hinds, 1844).
1959. *Nassa margaritifer* (Dunker), Barnard. Ann.Sth.African Mus. 45:110; 1973 Kensley, Sea-shells South Africa p.162, fig.599.
1961. *Nassarius margaritifera* Dunker, Spry, Tangan.Notes & Rec. No.56:23.
1961. *Zeuxis margaritiferus* (Dunker), Habe, Col.Illust.shells Japan 2:65, pl.32,fig.25; 1966 Habe & Kosuge, Shells world col. 2:62,pl.22,fig.31.
1972. *Nassarius (Zeuxis) margaritiferus* (Dunker), Cernohorsky, Rec.Auckland.Inst.Mus. 9:170, fig.122 (shell), fig.141 (radula).
1982. *Nassarius margaritiferus* (Dunker), Kaicher, Card car.world-wide shells, Pack No. 31:3182.

Shell up to 31.0mm in length, elongate-ovate, conical, very solid, teleoconch of 7-8½ weakly convex to almost flat-sided whorls, protoconch of 2½-2¾ glassy-brown, finely carinate embryonic whorls: sculptured with regular round small nodules which are arranged in a spiral and axial pattern, penultimate whorl with 4-7 rows of nodules and body whorl with 12-15 rows and additional 4-6 oblique cords on the siphonal fasciole; sutural nodules are interrupted from remaining sculpture by a shallow, smooth trough. Aperture moderately narrow, outer lip thick but not strongly varicose, interior with strong denticles and occasionally small, bluntly spinose denticles on the edge of the outer lip, columellar callus thick but narrow and well bordered, columella denticulate along entire length, siphonal notch deep, anal canal distinct. White or cream in colour, irregularly streaked or banded with purple-brown, columellar callus and edge of outer lip white or cream, interior of aperture banded purple-brown. Operculum brown and simple at margins.

TYPE LOCALITY. None *(margaritifer);* Vanikoro, Solomon Is *(reticulatum* Quoy & Gaimard; *quoyii);* Curimas, Philippines *(costellifera).* Bali, Indonesia, is here designated as the type locality (specimens in AMS).

DISTRIBUTION. From East Africa to the Andaman Is, Japan and the New Hebrides. On reefs, in sandpockets, from the intertidal zone to a depth of 22 m.

Type specimens. A specimen, probably a syntype of *N.margaritifer* (Dunker), is in Dunker's collection, Zoological Museum, Humboldt University, Berlin, length 19.9 mm, width 10.3 mm. Three syntypes of *Nassa costellifera* (A.Adams), are in the British Museum (N.H.), London No.1973167, and the specimen measuring length 26.0 mm, width 14.4 mm, is here selected as the lectotype (pl.27, fig.8).

Material examined. EAST AFRICA: Nyali beach, Mombassa; Tiwi river, S. of Mombassa (both ZMC); Chukwani, W.Zanzibar (AIM); Bweju, S.E. Zanzibar (USNM); ANDAMAN IS: (AMS); NICOBAR IS: Little Nicobar I (ZMC); MALAYSIA: Singapore (USNM); INDONESIA: Bali (AMS); Banjar Sari, N.E. of Engano I, S. Sumatra (coll. McCausland): PHILIPPINES: Ladrones; Lubang I, Mindoro; Manila Bay, Luzon (all USNM); Puerto Galero, Mindoro; Cebu (both AMS); Samar (coll. Norton); CHINA: Yellow Sea (BMNH); Whampoa (USNM); RYUKYU IS: Bolo Pt. and Seragaki, Okinawa I (coll. Deynzer); S.Kunigami-Gun, Okinawa (USNM); Naha, Okinawa (LACM); JAPAN: Wakayama, Honshu (USNM); CAROLINE IS: Tomil Harbour, Yap I; Kusaie (both USNM);Ponape (AMS); MARIANAS IS: Agana Bay, Guam I (USNM); Rizal beach, Guam I (SDMNH); off Orote Pt., Guam I, 18-22m (coll.Deynzer); Piti Beach, Guam I (coll.McCausland); Saipan I (coll.Richardson); Cruz beach, Guam I (coll.Salisbury); SOLOMON IS: Banika I, Russell group (Auckland Univ.); Pavuvu I, Russels Str.(USNM); Reff I, Santa Cruz group; Wagina I, Choiseul I (both AMS); Siota I, Florida group (coll.Lee); NEW HEBRIDES: Bushmens Bay, Malekula I (coll. Eker); Undine Bay, Efate I; Surunda, Espiritu Santo (both coll.Coles).

The species may range as far as the Red Sea if Bisacchi's (1930) record from Yemen is correct. Rousseau (1854) proposed the substitute name *Nassa quoyii* for the specimen illustrated by Quoy & Gaimard (1833) under the name *"Buccinum reticulatum* Linnaeus", from Vanikoro, Solomon Is, but reported the species from "Mangareva" (= Gambier Is). According to records available to me, no specimens from further east than the New Hebrides have been seen.

Nassarius (Zeuxis) multicostatus (A.Adams, 1852)
(Plate 27, figs.9,10; Plate 28, Fig. 1)

1852. *Nassa multicostata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:98; 1853 Reeve, Conch.Icon. 8:pl.20,figs.136a,b; 1934 Mari, J. Conchyl. 78:9.
1907. *Nassa multiplicata* Schepman, Samml.geol.Reichs-Mus.Leiden, (1), 8: 175,pl.11,figs.2,2a.
1978. *Nassarius (Zeuxis) multicostatus* (A.Adams), Cernohorsky, Trop.Pacific Mar.shells p. 87, pl.27,fig.5.
1982. *Nassarius multicostatus* (A.Adams), Kaicher, Card cat.world-wide shells, Pack No.31:card 3186.

Shell up to 17.0mm in length, elongate-ovate, solid, teleoconch of 5-6 convex whorls which are occasionally roundly subangulate at sutures, protoconch of 3¼-3½ glassy embryonic whorls, last 2 whorls carinate; sculptured with very strong, broad and rounded axial ribs, ribs either wide-spaced or slender and more numerous and crowded on body whorl; spiral sculpture consists of very fine, short grooves in interspaces of axial ribs, base of body whorl with 4-5 spiral threads, followed by a prominent angulate cord and 3-4 cords on siphonal fasciole. Aperture narrow, outer lip thick but not strongly varicose, edge of outer lip narrowly calloused, interior denticulate-lirate, columellar callus prominent, partly spreading onto body whorl, concave above parietal wall and thickly calloused at the end of the swept up suture, columella with 2-8 denticles, siphonal canal deep, anterior tip of columella and outer lip frequently drawn out, anal canal distinct. White in colour, some specimens with an interrupted orange-brown band on penultimate whorl, body whorl suffused with orange-brown, columellar callus cream to dark shining orange. Operculum translucent-brown, simple or with 1-3 denticles at margins.

TYPE LOCALITY. Batangas, Luzon Is. Philippines, 7 m *(multicostatus);* Celebes, Pleistocene of Indonesia *(multiplicata).*

DISTRIBUTION. From Indonesia to the Philippines and the Solomon Is. In clean coral sand and black sand, from 3-20 m.

Type specimens. The two syntypes of *N. multicostatus* (A.Adams), are in the British Museum (N.H.), London, No.1973171, and the specimen measuring length 13.0 mm, width 7.3 mm, is here selected as the lectotype (pl.27, fig.9). The holotype of *Nassa multiplicata* Schepman, is in the Rijksmuseum van Geologie en Mineralogie, Leiden, length 15.1 mm, width 8.2 mm.

Material examined. PHILIPPINES: Batangas, Luzon I (BMNH); PAPUA NEW GUINEA: Minokwari (USNM); Manus I, 20 m (coll. Blondell); Nordup, New Britain (coll. Parkinson); Rabaul, New Britain, 3m (coll. Prior); Laing I lagoon, Hansa Bay, 6-11m (coll. Bratcher): SOLOMON IS: Treasury I (coll.Gardner).

Fossil record. PLEISTOCENE: Celebes (Rijksmus.Leiden).

The species appears to be moderately rare and the distributional range may actually be greater than present day records would indicate.

Nassarius (Zeuxis) concinnus (Powys, 1835)
(Plate 28, figs. 2-9)

1835. *Nassa concinna* Powys, Proc.Zool.Soc.Lond. Pt.3.95; 1853 Reeve, Conch. Icon. 8:pl.13,fig.82; pl.14,fig.91; 1907 Couturier, J. Conchyl. 55:138; 1915 Tesch in Wanner, Palaeont.v.Timor 5:61, pl.81,figs.136a,b; 1933 Dautzenberg & Bouge, J. Conchyl. 77:211; 1934 Mari, J. Conchyl. 78:52.
1854. *Nassa crebrilineata* Rousseau, Voy.Pole Sud,Zool. 5:18, pl.21,figs.33,34.

1874. *Nassa concentrica* Marrat, Ann.Mag.Nat.Hist. (4), 13:71.
1876. *Nassa interlirata* E.A.Smith,J.Linn.Soc.Lond. 12:545; pl.30,fig.5.
1877. *Nassa smithii* Marrat, Prop.new forms genus *Nassa* p.7; 1877 Marrat, J.Conch. 1:204.
1877. *Nassa rotundicostata* Marrat, Prop.new forms genus *Nassa* p.8.
1877. *Nassa cribraria* Marrat, *ibid.* p.12,pl.1,fig.20.
1883. *Nassa (Zeuxis) concinna* Powis, K. Martin, Samml.geol.Reichs-Mus.Leiden, (1), 3:211, pl.6,fig.125.
1894. *Niotha voluptabilis* Jousseaume, Bull.Soc.Philomatique 5:101.
1895. *Nassa (Zeuxis) concinna* Powis, K. Martin, Samml.geol.Reichs-Mus.Leiden 1:114, pl.18,figs.260,260a.
1898. *Nassa (Hima) concinna* Powis, Melvill & Sykes, Proc.Malac.Soc.Lond. 3:38; 1903 Sturany, Denk.k.Akad.Wiss.math.-nat.Classe Wien 74:244; 1955 Marche-Marchad, J. Conchyl. 95:32.
1899. *Nassa (Hima) cribraria* Marrat, Melvill & Sykes, Proc.Malac.Soc.Lond. 3:221.
1907. *Nassa concinna* forma *minor* Schepman, Samml.geol.Reichs-Mus.Leiden, (1), 8:177.
1930. *Hima concinna* Pow., Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:66.
1935. *Nassarius (Alectrion) pseudomundus* Oostingh, Weten.Meded.Mijnb.Ned.-Indie No. 26:71, pl.6,figs.71a,b, 72a,b, 73, 74a,b, 75.
1960 *Nassarius (Niotha) concinnus* (Powys), MacNeil, U.S.Geol.Surv.Prof.Pap. No.339:80, pl.13,fig.23.
1961. *Zeuxis concinnus* (Powys), Habe, col.illust.shells Japan 2:64, pl.32,fig.23.
1966. *Allanassa concinna* (Powys), Habe & Kosuge, Shells world col. 2:62, pl.22,fig.32.
1966. *Allanassa concentrica* (Marrat), Habe & Kosuge, *ibid.*, 2:60, pl.22,fig.1.
1975. *Nassarius concinnus* (Powis), Tchang Si et.al., Studia Marina Sinica No.10:123, pl.3,fig.19; 1982 Kaicher, Card Cat.world-wide shells, Pack No.31: card 3153.
1982. *Nassarius (Zeuxis) concinnus* (Powys), Cernohorsky, Rec.Auckland Inst. Mus. 9:177, figs.132,133.

Shell up to 21.0 mm in length, elongate-ovate and occasionally inflated anteriorly to sutures in mature specimens, teleoconch of 7-8¼ convex whorls, protoconch of 2½-3 glassy embryonic whorls, last whorl finely carinate, sutures adpressed; sculptured with moderate to numerous axial riblets which number from 23-57 on the penultimate and from 20-52 on the body whorl; spiral sculpture consists of very fine spiral striae which are either confined to interspaces of axial ribs or override axials rendering these slightly nodulose; striae number from 8-10 on the penultimate and from 10-13 on the body whorl, followed by 6-10 nodulose cords and an additional 5-7 cords on the siphonal fasciole, sutural denticles distinct, occasional senile individuals with a few, low, broad varices. Aperture narrow, outer lip thick and broadly variced, interior of aperture with 6-10 denticles, columellar callus narrow and only slightly broadening anteriorly and with 7-13 small denticles, siphonal notch and anal canal distinct. White to orange-brown in colour, spire whorls with 1-2 brown bands anterior and posterior to sutures, body whorl usually with 3 brown bands, aperture white to pale orange-brown and sometimes with darker bands within.

TYPE LOCALITY. Tubuai I, Austral I *(concinnus* and *concentrica);* San Christoval, Solomon Is *(interlirata);* Torres Str., N.Australia *(crebrilineata);* Djibouti, [Somali Republic], Red Sea *(voluptabilis);* none *(smithii; rotundicostata);* Philippines *(cribaria);* Kali Bioek and Kali Glagah, Boemaijoe, Java, Pliocene of Indonesia *(pseudomundus).*

DISTRIBUTION. From the Red Sea and the Persian Gulf to Japan and the Tuamotu Archipelago. In clean and weedy coral sand, subtidal to a depth of 150 m.

Type specimens. Three syntypes of *N.concinnus* (Powys), are in the British Museum (N.H.), London, No.197362, and the specimen measuring length 18.8 mm, width 9.2 mm, is here selected as the lectotype (pl.28, fig.2). The holotype of *Nassa interlirata* E.A.Smith, is in the same Institution, No.1876.1.10.28, length 6.4 mm. The following types are in the Merseyside County Museum, Liverpool: five syntypes of *Nassa concentrica* Marrat, and the specimen measuring length 9.6 mm, width 5.3 mm, is here designated as the lectotype (pl.28,fig.5); four syntypes of *N.smithii* Marrat, and the specimen measuring length 12.6 mm, width 6.0 mm, is here designated as the lectotype (pl. 28,fig.4); two syntypes of *N.rotundicostata* Marrat, and the specimen measuring length 12.0 mm, width 6.7 mm, is here designated as the lectotype (pl.28, fig.6); ten syntypes of *N.cribraria* Marrat, and the specimen measuring length 9.6 mm, width 5.6 mm, is here designated as the lectotype (pl.28,fig.7). The holotype of *N.crebrilineata* Rousseau, length 18.0 mm, width 9.0 mm, is in the Museum National d'Histoire Naturelle, Paris. Syntypes of *N.voluptabilis* Jousseaume, are in the same Institution, and the specimen measuring length 12.0 mm, width 6.2 mm, is here designated as the lectotype (pl.28,fig.3).

Material examined. RED SEA: Eilat, Gulf of Aqaba (TAU); Djibouti, Somali Republic, Gulf of Aden (MNHNP); PERSIAN GULF: 13 km E.N.E. of Patrick Stewart I Bank, 69 m (ZMC); EAST AFRICA: Mozambique (USNM); N.Ile Pamanzi, Mayotte I, Comoros Is (MNHNP); MADAGASCAR: Tulear (SMOM); REUNION I: Lagon de la Saline ,(coll. Martin); MAURITIUS: (AIM; ZMC; USNM; LACM; AMS); THAILAND: Koh Chik; Koh Chang, *c.*56 m (both ZMC); INDONESIA: Java, 8°30'S & 114°28'E, 70-150 m; Java, 8°26'S & 114°29'E, 70 m

(both ZMC); Kalahabi Harbour, Alor I, N. of Timor; Kuta Beach, Bali (both coll.McCausland); PHILIPPINES: Mariqui, Mindanao (USNM); Matabungkay, S.S.W. of Manila (AMS); Dungaree Beach, Subic Bay (coll. Salisbury); CHINA: Straits of Taiwan, S.China Sea, *c.*150 m (NSMT); Peitaho (LACM); RYUKYU IS: Okinawa I (USNM; LACM; SDMNH); Seragaki, Okinawa (coll.Deynzer); JAPAN: Osima, Osumi (USNM); MARIANAS IS: Guam I (USNM); Apra Harbour, Guam I (coll. McCausland); Piti Pt., Guam I, 11 m (coll.Deynzer); CAROLINE IS: Kapingamarangi (USNM); Ponape (LACM; SDMNH); MARSHALL IS: Kwajalein Atoll (USNM); Enewetak lagoon (coll.Johnson); PAPUA NEW GUINEA: Kuia I, Lusancay I, Trobriand Is; East Cape; Finschhafen (all AMS); AUSTRALIA: Western Australia: Dampier (coll.Hansen); Roebuck Bay, Broome; (both AMS); Northern Territory: Darwin (AMS); Queensland: Heron I (NMV); Daydream I, Whitsunday Passage (coll.Powell); Mornington I (coll.Marrow); Lizard I; Trinity Bay; Low Isles near Port Douglas; Buchan's Pt., N. of Cairns; off Undine reef; off Cape Upstart, 37 m; Green I, off Cairns; Yarracutter reef, off Cardwell; Slasher's reef, N. of Townsville; Tryon I, Capricorn group; N.E. Herald Cay, Coral Sea; Northwest I (all AMS); Hope I (coll.Lee); off Port Douglas (coll.Ritter); South Molle I (coll.Worthy); SOLOMON IS: Tulagi I, Florida group (coll. Hallinan); Bonigi I, Guadalcanal, 11-21 m (coll.Dillworth); Ata (AMS); NEW HEBRIDES: Teuma Bay, Efate I, 47 m (coll.Eker); Vila, Efate I (coll.Lepage); LOYALTY IS: Lifu I (AIM); NEW CALEDONIA: (ZMC); Ovaco (AMS); FIJI IS: Lomalagi, S. Viti Levu (coll.Eker); W.of Rat Tail Passage, Suva reef (coll.Marrow); Suva, S. Viti Levu (SDMNH); Nadi Bay, W. Viti Levu (AMS); Lakeba I, Moce I and Karoni I, all Lau group (AIM); Lami, S. Viti Levu (coll.McCausland); Ogea I, Lau group (coll.Northgrove); SAMOA IS: Apia Harbour, Upolu (coll.Powell); Pago Pago (USNM); Fagaitua Bay, Tutuila I (LACM); TONGA IS: Nuku'alofa (coll.Lamb); Pangai I; Nuku'alofa (LACM); Vavau I (coll.Northgrove); COOK IS: Rarotonga (AIM); AUSTRAL IS: Tubuai I (USNM: coll.Trondle); SOCIETY IS: Tahiti (coll.Powell); off Fare, Huahine I (LACM); Punaavia, Tahiti (AMS); S.coast of Moorea I (coll.WOC); TUAMOTU ARCHIPELAGO: (USNM); Anaa I (coll.Trondle).

Fossil record. PLIOCENE: Noil Lioe, Timor, Indonesia (Tesch in Wanner 1915); Bandjar Andjar, Java, Indonesia (K.Martin 1882); Nakoshi sand, Okinawa, Ryukyu Is (MacNeil 1960); PLEISTOCENE: Grissee, Java, Indonesia (K.Martin 1895.)

Tomlin (1940) correctly placed Marrat's four new species in the synonymy of *N.concinnus.* The typical form has numerous, slender axial riblets, and *voluptabilis* Jousseaume also belongs to the multi-ribbed form. The forms *rotundicostata, cribraria* and *concentrica* have fewer ribs, while *smithii* is intermediate between the few-ribbed and multi-ribbed forms.

There are specimens of *N.concinnus* labelled "Oahu, Hawaii Is" in the Los Angeles County Museum of Natural History. The species has as yet not been reliably recorded from the Hawaiian Islands, and this record requires confirmation. The holotype of *Nassa interlirata* E.A.Smith, although badly worn, is just recognizable as a minute individual of *Nassarius concinnus.*

Nassarius (Zeuxis) haldemanni (Dunker, 1847)
(Plate 28,figs. 10-13)

1847. *Buccinum haldemanni* Dunker, Zeit.f.Malakozool. 4:62; 1849 Philippi, Abb.Beschr.Conchyl. 3:64, pl.2,fig.4.
1852. *Nassa sertula* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107; 1853 Reeve, Conch.Icon. 8:pl.14,fig.89; 1932 Tomlin. Proc.Malac.Soc.Lond. 20:43; 1934 Mari, J.Conchyl. 78:48.
1895. *Nassa (Zeuxis) sertula* A.Adams, K.Martin, Samml.geol.Reichs-Mus.Leiden 1:113, pl.18.figs.259,259a,
1930. *Nassarius (Zeuxis) isseli* Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:57,textfigs.4,5.

Shell up to 18.0 mm in length, elongate-ovate and somewhat biconical, teleoconch of 5½-6 convex whorls, protoconch of 3-3¼ glassy-brown embryonic whorls, sutures tight, finely incised and almost impressed; post-embryonic whorls sculptured with numerous, slender axial riblets, riblets becoming absent on last 2-3 whorls except for 2-3 crowded axial ribs behind outer lip varix; axial riblets on spire whorls crossed by 5-6 fine spiral striae, striae reduced to 1-2 slender sutural cords on last 2 whorls and additional 9-10 cords at base, 8-9 oblique cords on siphonal fasciole and from 22-28 short spiral threads on the back of the outer lip crossing varix. Aperture narrow, outer lip thick and broadly variced, interior with 8-9 strong denticles, columellar callus narrow and well-bordered, columella with 7-11 small denticles along its entire length, siphonal notch and anal canal distinct. First 2-3 post-embryonic whorls white, later whorls with 1-2 interrupted orange-brown spiral bands on spire whorls and usually 3 such bands on body whorl, some individuals with additional nebulous orange-brown streaks, columella and aperture white.

TYPE LOCALITY. East Indies *(haldemanni);* Masbate, Philippines *(sertula);* Massawa, Red Sea *(isseli).*

DISTRIBUTION. From the Red Sea to the Philippines and the Fiji Is. Subtidal, to a depth of 40 m.

Type specimens. The holotype of *N.haldemanni* (Dunker) is in the Zoological Museum, Humboldt University, Berlin, length 13.6 mm, width 7.5 mm. Two syntypes of *Nassa sertula* A.Adams, are in the British Museum (N.H.), No.1973146, and the adult syntype measuring length 16.0 mm, width

8.0 mm, is here designated as the lectotype (pl.28, fig.11). The holotype of *Nassarius isseli* Bisacchi, is in the Museo Civico di Storia naturale, Genova, length 6.5 mm, width 3.5 mm.

Material examined. THAILAND: west coast, 8°45'24"N & 98°07'48"E, 29-31 m (ZMC); INDONESIA: Kei-Oerne, Kai Is, Moluccas (ZMC); PHILIPPINES: Masbate (BMNH); FIJI IS: Moce I, Lau group (AIM).

This appears to be a rare species which has been confused with *N.comptus* (A.Adams). For further discussion refer to the latter species.

Nassarius (Zeuxis) comptus (A.Adams, 1852)
(Plate 29, figs.1-7)

1834. *Buccinum elegans* Kiener, Spec.gen.icon.coq.viv. 9:56, pl.24,fig.97 (non Costa, 1822; nec J. de Sowerby, 1826).
1852. *Nassa compta* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107; 1853 Reeve, Conch.Icon. 8:pl.16, figs.106a,b.
1852. *? Nassa cinnamomea* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107; 1854 Reeve, Conch.Icon. 8:pl.19,fig.126; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:42; 1934 Mari, J.Conchyl. 78:41.
1880. *Nassa bucculenta* Marrat, Var.shells genus *Nassa*, pp.39,79.
1880. *Nassa polita* Marrat, *ibid.*, pp.24,79 (non *Buccinum politum* Bivona, 1832 = *Nassarius*).
1900. *? Nassa xesta* Sturany, Anz.k.Akad.Wiss.math.-nat.Classe Wien 17:199; 1903 Sturany, Denk.k.Akad. Wiss.math.-nat Classe Wien 74:223, pl.2, figs.6a,b.
1911. *Nassa (Alectryon) flammulata* Schepman, Siboga-Exped.49d:314, pl.19, figs.12a,b (non Preston, 1909).
1929. *Nassarius (Zeuxis) tateyamensis* Kuroda, Venus:Jap.J.Malac. 1:90,94, pl.3,fig.12.
1930. *Nassarius (Telasco) xestus* (Sturany), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:58.
1961. *Zeuxis excellens* Kuroda & Habe in Habe, Col.illust.shells Japan 2:64, App.p.24, pl.32,fig.22; 1964 Habe, Shells west.Pacific col. 2:100, pl.32,fig.22.
1972. *Nassarius (Zeuxis) comptus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:166, figs.108-110.
1972. *Nassarius (Zeuxis) flammulatus* (Schepman), Cernohorsky, *ibid.*, 9:177, fig.131 (shell), fig.145 (radula).

Shell up to 28.0 mm in length, slender to broadly ovate, shining, teleoconch of 6-7¼ convex and occasionally inflated whorls, protoconch of 2¾-3¼ glassy, finely carinate embryonic whorls, sutures usually narrowly ledged; post-embryonic whorls sculptured with axial ribs and 3-5 overriding spiral striae, spiral and axial sculpture becoming obsolete on last 2-3 whorls, and only occasionally with a subsutural groove or cord, back of outer lip with 4-6 crowded axial ribs, base of body whorl with 2-10 spiral cords, siphonal fasciole with 4-8 oblique cords, siphonal notch and anal canal distinct. Aperture moderately open, outer lip thickened but not strongly variced, interior with 10-20 lirate denticles, anterior end of outer lip usually longer than tip of siphonal fasciole, columellar callus narrow, well-bordered and either impressed or laminate anteriorly, columella concave and with 2-15 denticles. White to fawn in colour, ornamented with orange-brown axial streaks and occasionally 2-3 nebulous, interrupted bands on body whorl and in some individuals brown spots at sutures, columella and aperture white. Operculum brown and serrate or almost simple at margins.

TYPE LOCALITY. Cape St.Antonio, South Africa [= ? error] *(comptus)*; Indian Ocean (*elegans* Kiener); Dumaguete, Negros I, Philippines *(cinnamomea)*; Philippines *(bucculenta)*; Mauritius (*polita* Marrat); near Hamil I, Red Sea, 39°55'E & 17°07'N, 212 m *(xesta)*; Ruma-Kuda Bay, Roma I, Indonesia, 36 m (*flammulata* Schepman); Tateyama Bay, Japan *(tateyamensis)*; off Cape Ashizuri, Kochi Pref., Shikoku, Japan, c.200 m *(excellens)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf throughout the tropical Indo-Pacific to Japan and the Society Is. In coarse coral sand, muddy sand or mud, subtidal to a depth of 700 m.

Type specimens. Two syntypes of *N.comptus* (A.Adams) are in the British Museum (N.H.), London, (no number), and the specimen measuring length 18.8 mm, width 9.2 mm, is here selected as the lectotype (pl.29, fig.1). The holotype of *Nassa cinnamomea* A.Adams, is in the same Institution, No.197321, length 23.8 mm, width 11.0 mm. Four syntypes of *N.bucculenta* Marrat, are in the Merseyside County Museum, Liverpool, and the specimen measuring length 14.0 mm, width 7.8 mm, is here designated as the lectotype (pl.29, fig.2). Two syntypes of *N.polita* Marrat, are in the same Institution, and the specimen measuring length 18.4 mm, width 8.8 mm, is here designated as the lectotype (pl.29, fig.7). Two syntypes of *N.flammulata* Schepman, are in the Rijksmuseum van Naturlijke Historie, Leiden, length of mature syntype 14.4 mm, width 7.5 mm and the holotype of *Zeuxis excellens* Kuroda & Habe in Habe, is in the National Science Museum, Tokyo, No.48262, length 25.0 mm, width 12.5 mm. The whereabouts of the type of *N.tateyamensis* (Kuroda) is unknown, and the type of *N.xesta* Sturany, which should be in the Natural History Museum, Vienna, can no longer be located (Dr. Wawra, *in litt.*)

Material examined. RED SEA: Dahlak Archipelago, 15°32'N & 40°23'E, 110 m; Oil Port, Eilat, Gulf of Aqaba, 121 m; S. of Nueiba, 550-700 m; off Nueiba, 329-403 m; off Mersat Abu Samra, 51-53 m (all TAU); PERSIAN GULF: 11 km E.N.E. of Patrick Stewart I Bank, 69 m (ZMC); GULF OF OMAN: Muscat (coll.Powell); EAST AFRICA: off Beira, Mozambique, 200 m (ZMC); Conducia Bay, Mozambique (Natal Mus.); MADAGASCAR: Tulear (SMOM); MAURITIUS: (AMS); Graved Bay, 4-6 m (ZMC); Flic-a-Flac (coll.Couacaud); REUNION I: Lagon de la Saline (coll.Martin); PAKISTAN: Karachi, 92 m (USNM); INDIA: off Tranquebar, 11°10'N & 79°59'E, 50 m (ZMC); Orissa coast (ZSI); SRI LANKA: (USNM); Palk Str., 10°02'N & 80°02'E, 22 (AMS); ANDAMAN IS: (ZSI); THAILAND: west coast, 8°45'24"N & 98°07'48"E, 29-31 m; near Koh Samit, Gulf of Thailand, 19 m; Koh Kam, 18 m; Mellem Koh Mesan, Cape Liant, 9-17 m; N.of Koh Kahdat, 9 m; S. of Koh Chuen, c. 56 m (all ZMC); Ko Surin I, Ranong; Similan, Phangnga; off Karon, Phuket, 26 m (all PMBC); Lem Sing (USNM); MALAYSIA: Singapore (Merseyside Cty.Mus.); INDONESIA: Tocal, Kei-Oerne, Kai Is, 21 m; Java, 8°26'S & 114°29'E, 70 m; Amboina Bay, *c.*128 m; Lampang Bay, Kai Is, 25 m; Sunda Str., 6°38'S & 105°21'E, 35 m; Taka Baco, Macassar, Celebes, c.25 m (all ZMC); Teluk Dodinga near Ternate, Halmahera, 31-42 m; off Tg Tutuhuhur, Piru Bay, Ceram, 26-48 m; W. of Toba I, N.end of Aru I (all WAM); off Bunting I, Malacca Str. (USNM); PHILIPPINES: Marinduque I (coll.Norton); Malake, Manila Harbour; Lubang I, Mindoro; W. of Palaui I, Luzon; off S.E. Tawi Tawi, 33 m; off Tinakta, Tawi Tawi group; off Antonia I, E.Panay, 48 m; W.Luzon; Linapacan Str., 84m; off Tacbuc Pt., E.Leyte, 104 m; off N.E.Panay, 48 m; off Nagubat I, E.Mindanao, 81 m (all USNM); CHINA: Straits of Taiwan, China Sea, c. 150 m (NSMT); Kulangan I, China Seas; off Pratas I, China Seas, 161 m (both USNM); Tongkang, Taiwan (Natal Mus.); JAPAN: Kikaigasima, Osumi; Nagasaki; off Sirakam, 379 m; Kii (all USNM) 32°15'N & 128°12'E, 65 m (ZMC); off Cape Ashizuri, Kochi Pref., Shikoku, 200 m (NSMT; USNM); MARIANAS IS: Piti Pt., Guam I, 11 m (coll.Deynzer); PAPUA NEW GUINEA: Laing I, Hansa Bay, 45-60 m (coll.Tursch); Matupi I, Rabaul, New Britain (coll.Prior); Rabarua, New Britain; Simpson Harbour, Rabaul, 92 m (both coll.Parkinson); AUSTRALIA: Western Australia: Geographe Bay (coll.Hansen); Broome (AMS); Port Hedland (coll.Powell); Northern Territory: Darwin (Natal Mus.; coll.Hansen); Clarence Strs., N.W. of Charles Pt., 12°09'S & 130°18'E, 33 m (WAM); Queensland: off Watson's Bay, Lizard I (coll.Willan); Dingo Beah (coll.Whitehead); Polka Pt., N.Stradbroke I, Moreton Bay (coll.Bessel); Cape Moreton, 117-128 m (coll.Powell); Hervey Bay; Bowen; Sinclair Bay, Cape Gloucester; S.E. of Redland jetty, Moreton Bay; off Groote Eylandt, Gulf of Carpentaria; off Urangan; off Woody I near Fraser I, 9 m; Hook I, Whitsunday Passage; Lindemann I; N. of Eagle I, 18 m; Dundowran; Cockle Bay, Magnetic I; Northwest I, Capricorn group; Seaforth near Mackay; N.Keppel I (all AMS); SOLOMON IS: Tutuba I, Espiritu Santo (coll.Coles); Bonigi I, Guadalcanal, 11-21 m (coll.Dillworth); NEW HEBRIDES: Teuma Bay, Efate I, 27-46 m (coll.Eker); Mele Bay, Efate I, 40 m (coll.Lepage); FIJI IS: Wakaya I near Ovalau I (AIM); Momi Bay, W.Viti Levu, 27 m (USNM); SAMOA IS: 18.2 km off Pilot's Flagstaff (AIM); SOCIETY IS: Faaone, Tahiti; Great Pass, Vairao, Tahiti, 240 m (both coll.Trondle); Tahiti (LACM).

The species is very variable in form. The typical form *comptus* is only moderately broad (synonyms *flammulata* Schepman), the form *bucculenta* is very broad, *excellens* is more slender and the very slender form *polita* Marrat is commonly encountered throughout the species range.

The type-locality of "Cape St.Antonio, Sth. Africa" is suspect. The species has not been reported from South Africa by either Tomlin (1928), nor Barnard (1959) or Kensley (1973).

The type-specimen of *Nassa cinnamomea* A.Adams, is very worn, holed on the body whorl and part of the spire is missing, and it is only tentatively assigned to the synonymy of *Nassarius comptus*. Tomlin (1932a) stated that the type of *cinnamomea* is just recognisable as a large *comptus*.

Nassarius (Zeuxis) amycliformis (Shuto, 1969)
(Fig. 124)

1969. *Glabrinassa amycliforma* Shuto, Mem.Fac.Sci.Kyushu Univ. (D), Geol. 19(1):146, pl.13,fig.22; pl.14,figs.6,8,10; textfig.27.

The species is closely similar to *N.comptus* (A.Adams), but appears to differ in the complete absence of axial and spiral sculpture on the teleoconch, with the exception of a few basal cords. In *N.comptus* the first 2-3 post-embryonic whorls are axially ribbed and spirally striate. *N.amycliformis* has 3⅔ embryonic whorls and reaches a length of 13.0 mm.

TYPE LOCALITY. Panay I, Ilo Ilo Basin, Upper Ulian formation, Pliocene of the Philippines.

DISTRIBUTION. Pliocene of the Philippines.

Type specimens. The holotype of *N.amycliformis* (Shuto), is in the Geology Dept., Kyushu University, No. GK-L 7511, length 11.9 mm, width 8.4 mm.

Nassarius (Zeuxis) micans (A.Adams, 1852)
(Plate 29, figs.8-11)

1852. *Nassa micans* A.Adams, Proc.Zool.Soc.Lond. Pt.19:106; 1853 Reeve, Conch.Icon. 8:pl.21,fig. 140; 1934 Mari, J.Conchyl. 78:9.

1852. *Nassa pallidula* A.Adams, *ibid.*, Pt.19:106; 1853 Reeve, Conch.Icon. 8:pl.16,figs.108a,b.
1854. *Nassa unicolor* Rousseau, Voy.Pole Sud, Zool. 5:76, pl.21,figs.13-15.
1870. *Zeuxis micans* A.Adams, Ann.Mag.Nat.Hist. (4), 5:426.
1901. *Nassa (Zeuxis) pallidula* A.Adams, Melvill & Standen, Proc.Zool.Soc.Lond. 2:411.
1916. *Nassa (Alectrion) unicolor* Hombron & Jaquinot, Preston, Rec.Indian Mus.Calcutta, 12:90.
1928. *Nassa (Zeuxis) unicolor* Hombron & Jaquinot, Melvill, Proc.Malac.Soc.Lond. 18:106.

Shell up to 23.0 mm in length, slender elongate-ovate, body whorl long, light in weight, teleoconch of 6-6¾ convex whorls, protoconch of 3-3¼ glassy finely carinate embryonic whorls, sutures narrowly canaliculate; 2-3 post-embryonic whorls sculptured with axial ribs and obsolete spiral striae and a row of sutural nodules, later whorls smooth but occasionally with a fine subsutural groove, back of outer lip with 2-4 close-set axial ribs, base of body whorl with 4-9 spiral threads, siphonal fasciole with 5-7 oblique cords, siphonal notch prominent, anal canal deep and with a turrid-like notch in mature specimens. Aperture narrow, elongate, outer lip thickened and narrowly variced, interior with 12-17 denticles, edge of outer lip with up to 12 spinose denticles, columella narrowly calloused and laminate in mature specimens and with 1-21 denticles. Fawn in colour, body whorl sometimes with 2-3 faint, ill-defined bands, columellar callus and edge of aperture white, deep interior banded with brown. Operculum brown, serrate or irregularly jagged at margins.

TYPE LOCALITY. Cagayan, Misamis, Mindanao, 46 m *(micans)*; Malacca, Indonesia, 18 m *(pallidula)*; Ceram I, Indonesia *(unicolor)*.

DISTRIBUTION. From Thailand to China and Papua New Guinea. Also reported in literature from the Gulf of Oman, India and Japan. In sand, subtidal to a depth of 50 m.

Type specimens. The holotype of *N.micans* (A.Adams) No.1973141, length 15.6 mm, width 6.8 mm, and the immature holotype of *Nassa pallidula* A.Adams No.1973143, length 17.4 mm, width 8.9 mm, are both in the British Museum (N.H.), London. The types of *N.unicolor* Rousseau, could not be found in the collection of the Museum National d'Histoire Naturelle, Paris (Dr.P.Bouchet, *in litt.*).

Material examined. THAILAND: off Karon, Phuket, 26 m (PMBC); INDONESIA: Edam Str., S. Java, 22 m; Lampang Bay, Kei-Oerne, Kai Is, 5°42'S & 105°17'E, 29 m (both ZMC); CHINA: S. of Pak Sha Tar Chan I, Tala Harbour, Hongkong, 18 m (AMS); PAPUA NEW GUINEA: Matupi, New Britain (coll.Prior).

The species is similar to *N.comptus* (A.Adams), but is considerably lighter in weight, the body whorl is longer, sutures narrowly subcanaliculate, varix more prominent and aperture narrow and more elongate. *N.micans* has a different colour pattern and lacks the orange-brown axial flames of *N.comptus*.

Nassarius (Zeuxis) foveolatus (Dunker, 1847)
(Plate 29, Figs.12,13; Plate 30, Fig.1)

1847. *Buccinum foveolatum* Dunker, Zeit.f.Malakozool. 4:63; 1858 Kuester, Syst.Conchyl.-Cab.Martini & Chem.,ed.2,3(1A):23, pl.6,figs.1-3.
1850. *Nassa foveolata* (Dunker), Moerch, Cat.Conchyl.C.P.Kierulf, p.17, pl.1,figs.10,10.
1852. *Nassa planocostata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:96.
1853. *Nassa planicostata (sic)* A.Adams, Reeve, Conch.Icon. 8:pl.12,figs.76a,b.
1853. *Nassa foveolata* "Dunker MS", Reeve, Conch.Icon. 8:pl.13,figs.83a,b; 1932 Tomlin, Proc.Malac. Soc.Lond. 20:96.
1854. *Nassa labida* Reeve, Conch.Icon. 8:pl.27,fig.179; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:96.
1887. *Nassa foveolata* (Dunker), v.Martens, J.Linn.Soc.Lond. 21:182.
1928. *Nassarius (Zeuxis) foveolatus* (Dunker), Melvill, Proc.Malac.Soc.Lond. 18:106.
1975. *Nassarius foveolatus* (Dunker), Cernohorsky, Rec.Auckland Inst.Mus.12:144, figs.51,51a.

Shell up to 22.0 mm in length, slender, elongate-ovate, teleoconch of 5½-6½ convex whorls, protoconch missing in specimens examined, sutures tight; sculptured with numerous, fine axial ribs which frequently become irregular and weak on the body whorl and number from 26-42 on the penultimate and from 25-33 on the body whorl; spiral sculpture consists of numerous fine spiral striae which are confined to the interspaces of axial ribs and number from 7-13 on the penultimate and from 18-21 on the body whorl apart from 5-7 stronger, granulose cords at base, spiral striae continue on to the back of the outer lip, siphonal fasciole with 6-7 cords, spire whorls with sutural nodules. Aperture narrow, elongate, outer lip thickened and with a prominent varix, interior with 8-12 denticles, columella narrowly calloused and with 7-11 almost geometrically placed rounded denticles, siphonal notch distinct, anal canal prominent. Leaden-grey to purplish-grey in colour, sutures and varix paler creamy-white, columella grey to violet, edge of aperture white, interior dark grey.

TYPE LOCALITY.Oriental India *(foveolatus)*; Payta, Peru = error! *(planocostata)*; none *(labida)*.

DISTRIBUTION. From Pakistan to Malaysia. On mudflats and among mangroves, within the intertidal zone.

Type specimens. Syntypes of *N.foveolatus* (Dunker), are in the Zoological Museum, Humboldt University, Berlin, and the specimen measuring length 17.2 mm, is here selected as the lectotype (pl.29, fig.12). Three syntypes of *Nassa planocostata* A.Adams, are in the British Museum (N.H.), London, No.1973153, and the syntype measuring length 17.0 mm, width 8.1 mm, is here selected as the lectotype (pl.29, fig.13). The type of *Nassa labida* Reeve, is lost.

Material examined. PAKISTAN: Karachi (USNM); INDIA: Madras (ZSI); THAILAND: Ko Maphrao, Phuket (PMBC); MALAYSIA: Batu Ferringhi, Penang (coll.McCausland); Singapore (coll.Johnson).

The taxon *N.planocostata* (A.Adams), has erroneously been reported from the west coast of South America, and this writer (Cernohorsky 1975a) has shown that the Peruvian locality is erroneous and that the species lives in the Indian Ocean.

Nassarius (Zeuxis) vanesi Oostingh, 1935
(Fig. 125)

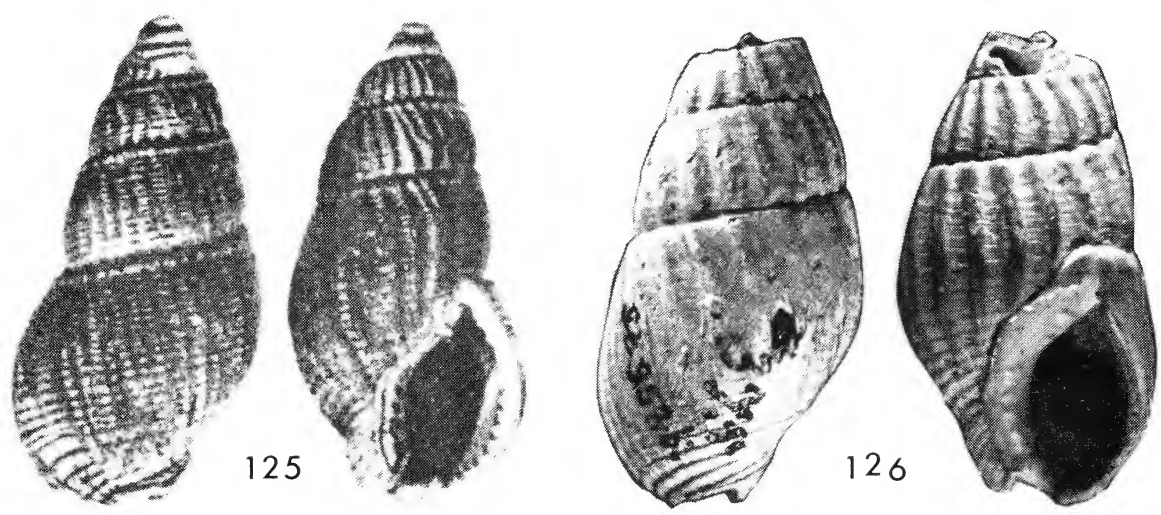
1935. *Nassarius (Alectrion) vanesi* Oostingh, Weten.Meded.Mijnb.Ned.-Indie No.26:73, pl.6,figs.76a,b.

The species is extremely similar to *N.foveolatus* (Dunker) and the only difference appears to be in the presence of sutural nodules on the body whorl in *N.vanesi*, whereas in *N.foveolatus* sutural nodules are present only on the spire whorls.

TYPE LOCALITY. Kali Bioek, Boemiajoe, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The tye of *N.vanesi* Oostingh, is in the Museum of Bandoeng, Indonesia. The original dimensions were length 21.0 mm, width 10.0 mm.



Figs. 125,126. Fossil Nassariinae. 125. *Nassarius (Zeuxis) vanesi* Oostingh. Type-figure; 21.0 mm (from Oostingh, 1935, pl.6,fig.76). 126. *N. (Z.) madiunensis* (K.Martin). Holotype Rijksmuseum van Geologie en Mineralogie, Leiden, RGM-9526; 17.3+ mm.

Nassarius (Zeuxis) protrusidens (Melvill, 1918)
(Plate, 30, figs.2-4)

1918. *Alectryon (Hima) protrusidens* Melvill, Ann.Mag.Nat.Hist. (9), 1:140, pl.4,fig.3.

Shell up to 20.0 mm in length, slender elongate-ovate, spire acuminate and frequently longer than the aperture, teleoconch of 6-7 weakly convex whorls, protoconch of 2¾-3 glassy, finely carinate embryonic whorls, sutures tight; sculptured with numerous axial ribs which number from 21-30 on the penultimate and from 17-33 on the body whorl; spiral sculpture consists of overriding spiral cords which render axial ribs nodulose and number from 3-6 on the penultimate and from 9-16 on the body whorl and an additional 5-6 cords on the siphonal fasciole; a moderately broad subsutural groove separates sutural nodules and gives the impression of a double row of nodules anterior to sutures.

Aperture narrow, outer lip thick but not prominently varicose, interior with 4-6 coarse denticles, columella narrowly calloused, concave and with 2-7 denticles, siphonal notch and anal canal prominent. Either white in colour and ornamented with 1-2 brown bands on spire whorls and 2-3 bands on body whorl, or brown and banded with white, aperture white.

TYPE LOCALITY. Karachi, Pakistan.

DISTRIBUTION. From Pakistan to Madagascar, China and N.E. Australia. In muddy sand and green mud, subtidal to 280 m.

Type specimens. The holotype of *N.protrusidens* (Melvill), is in the British Museum (N.H.), London, No.1921.1.28.3, length 11.4 mm, width 5.6 mm.

Material examined. MADAGASCAR: North Pass, Tulear lagoon, 43°37'21"W & 23°20'48"S, 20 m (SMOM); REUNION I: Baie de la Possession, 175 m (coll.Martin); PHILIPPINES: off Adyagan I, E. Masbate, 247 m; off Gigantangan I, N.W. Leyte, 209 m; S.W. of Destacado I, 247 m; off Dumurug Pt., Masbate, 280 m (all USNM); AUSTRALIA: Double I, Wide Bay, Qld., 47 m (coll.Mason).

Nassarius (Zeuxis) madiunensis (K.Martin, 1895)
(Fig.126)

1895. *Nassa (Zeuxis) madiunensis* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.F. 1:114, pl.18,figs.261,261a.
1919. *Nassa madiunensis* K.Martin, Palaeozool,Kennt.Java p.84; 1928 K.Martin, Wet.Meded.Mijnb.Ned.-Indie No.10:9; 1931 van der Vlerk, Leidsche geol.Meded. 5:233.

The elongate shell consists of flattened whorls which are separated from each other by a sharp but not deep suture. Whorls carry many slender, weakly "sickle-shaped" curved axial ribs which are barely thickened posteriorly to the suture. The interspaces have short, sharply incised spiral grooves and the subsutural groove is slightly broader yet shallow and also does not override the axial ribs so that sutural nodules are lacking. Towards the base axial ribs become obsolete but spiral cords are more distinct and continuous. Aperture elongate-ovate, canal clearly defined, outer lip moderately thickened, interior with 9 lirae, columella narrowly calloused and folded and ornamented with denticles and a parietal fold. [Free translation].

TYPE LOCALITY. Sondé, Madiun, Gendingan district, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The holotype of *N.madiunensis* (K.Martin), is in the Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9526, length 17.3 mm, width 9.8 mm. The specimen has only 3 whorls left, spire whorls being missing.

Nassarius (Zeuxis) fraudator Cernohorsky, 1980
(Plate 30, figs.5-7)

1980. *Nassarius fraudator* Cernohorsky, Rec.Auckland Inst.Mus. 17:141, figs.12-15 (shell), fig.16 (radula), fig.17 (operculum).
1981. *Nassarius (Zeuxis) fraudator* Cernohorsky, Rec.Auckland Inst.Mus. 18:172, figs.63-65.

Shell up to 18.0 mm in length, elongate-ovate, solid, teleoconch of 6-7 flat-sided whorls, protoconch incomplete in specimens examined; post-embryonic whorls sculptured with strong, angulate axial ribs which are weakly indented at sutures to form a row of not very prominent sutural nodules, last 2 whorls very variable in sculpture, penultimate whorl either smooth or with up to 15 axial ribs, ventral side of body whorl with 4-7 strong, sinuous axial ribs, dorsal side without ribs, sutures of last 2 whorls with a low, ill-defined sutural girdle; spiral sculpture usually absent but occasionally fine spiral striae may be present, base of shell with 4-5 spiral cords, siphonal fasciole with 5-8 cords, siphonal notch and anal canal prominent. Aperture narrow, outer lip thickened, prominently variced and with short spiral threads in the depression of the varix, interior with 6-8 lirate denticles, columella with a narrow well-bordered callus, and 4-9 round denticles, parietal denticle distinct. Variable in colour, usually dark brown, tan or grey, sutures and varix white to cream, occasional specimens off-white with only broad brown bands on last 2 whorls, aperture white but brown deep in interior. Operculum yellowish-brown, margins simple or obsoletely serrate.

TYPE LOCALITY. Somerset Bay, Cape York Peninsula, Nth. Queensland, Australia.

DISTRIBUTION. From Exmouth Gulf, Western Australia to the southern coast of Papua New Guinea and Cape York, Queensland. On sand-flats, within the intertidal zone.

Type specimens. The holotype of *N.fraudator* Cernohorsky, is in the Australian Museum, Sydney, No. C-114468, length 17.5 mm, width 9.3 mm.

Material examined. AUSTRALIA: Queensland: Saibai village, Saibai I, Torres Str.; Mud Bay, Cape York; Somerset Bay, Cape York; near Bamaga, N.W. Cape York Peninsula (all AMS); Northern Territory: Darwin;

Rose River Mission, Arnhem Land, Gulf of Carpentaria (both AMS); Western Australia: S.E. of Exmouth homestead, S. of Learmouth, Exmouth Gulf (AMS); Broome (AIM); Barred Creek, N. of Broome (AIM; NMV); Willy Willy Creek (NMV); PAPUA NEW GUINEA: Hall Sound, N.W. of Port Moresby (AMS).

Nassarius (Zeuxis) whiteheadae sp. n.
(Figs. 127,128)

Shell up to 13.0 mm in length, elongate-ovate, spire occasionally produced, solid, teleoconch of 4-5¼ weakly convex whorls, upper spire whorls angulate at sutures, protoconch of 2¼-2½ embryonic whorls, nucleus small, last embryonic whorl large, convex and axially finely striate for about half a turn and frequently appearing slightly distorted; sculptured with strong, angulate and slightly oblique axial ribs which continue to the ventral side of the body whorl but become obsolete on the dorsal side where they are only indicated in the form of sutural nodes; axial ribs number from 12-18 on the penultimate and from 5-8 on body whorl; spiral sculpture consists of extremely fine, macroscopically punctate spiral grooves which number from 5-7 on the penultimate and from 9-13 on the body whorl, followed by 4-5 spiral cords at base and 3-4 cords on the siphonal fasciole; a shallow subsutural groove produces a row of moderately distinct sutural nodules. Aperture narrow, outer lip thick, varix strong and broad, interior with 6-9 denticles, posterior edge of outer lip constricted near anal canal and producing a small point, columella with a narrow, well-bordered callus, and with 4-8 small denticles and a basal fold, siphonal notch and anal canal deep. Uniformly cream to light fawn in colour, aperture whitish.

TYPE LOCALITY. Sinclair Bay, Edgecumbe Bay, Nth. Queensland, Australia, 20°07'S & 148°27'E, intertidal.

DISTRIBUTION. Known to date only from North Queensland, Australia, 20°05'S – 20°07'S & 148°27'E – 148°30'E.

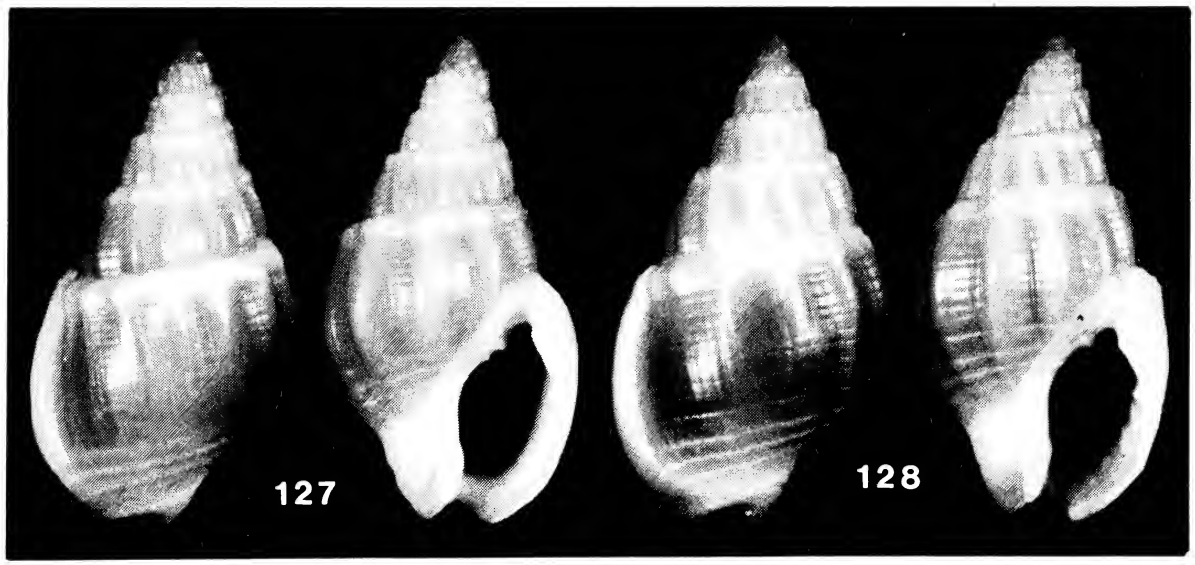
Holotype. In the Australian Museum, Sydney, No. C-114341, length 11.1 mm, width 5.4 mm (fig.127).

Paratypes. Numerous paratypes from the type locality, No. C-114341 and C-137738, and from Dingo Beach No. C-137736 and C-137737, in the AMS, other paratypes in AIM, and the Queensland Museum, Brisbane, Australia.

Material examined. AUSTRALIA: Queensland: Sinclair Bay, Edgecumbe Bay, 20°07'S & 148°27'E; Dingo Beach, S.E. of Bowen, 20°05'S & 148°30'E (both AMS).

The species is similar to *N.fraudator* Cernohorsky, but differs in its smaller size, more slender, offset spire whorls, unusual type of paucispiral protoconch, more prominent puncto-striate sculpture and different colouring.

The species is named for Mrs T. Whitehead, Brisbane, Australia, who has been involved in malacological studies for many years and who on many occasions supplied needed research material.



Figs. 127, 128. *Nassarius (Zeuxis) whiteheadae* sp. n. 127. Holotype AMS No.C-114341; 11.1 mm. 128. Paratype from Dingo Beach, Qld., Australia; 10.0 mm.

Nassarius (Zeuxis) subtranslucidus (E.A.Smith, 1903)
(Plate 30, figs.8-12)

1903. *Nassa subtranslucida* E.A.Smith, Fauna & Geog.Maldive & Laccadive Arch. 2:607, pl.35,fig.11.
1961. *Zeuxis hayashii* Habe, Col.illust.shells Japan 2:App.p.23, pl.32,fig.15.
1964. *Niotha hayashii* (Habe), Shells west.Pacific col. 2:99, pl.32,fig.15.
1980. *Nassarius subtranslucidus* (E.A.Smith), Cernohorsky, Rec.Auckland Inst.Mus. 16:180, figs.22-26 (figd.types of *subtranslucidus* and *hayashii*).

Shell up to 13.0 mm in length, elongate-ovate, shining, occasionally translucent, teleoconch of 4½-5 convex whorls, protoconch of 3¼-3¾ glassy, carinate embryonic whorls, early spire whorls angulate; sculptured with slender and occasionally angulate axial ribs, ribs either continuous to the back of the outer lip or obsolete on last 1½ whorls, ribs numbering from 8-25 on the penultimate and from 2-25 on the body whorl; spiral sculpture consists of short weakly impressed spiral grooves, grooves occasionally obsolete on body whorl and numbering from 5-12 on the penultimate and from 0-14 on the body whorl, apart from 5-6 nodulose basal cords and 4-5 cords on the siphonal fasciole, and a moderately weak subsutural groove barely separates sutural nodules, siphonal notch and anal canal distinct. Aperture moderately narrow, outer lip thickened and narrowly variced, interior with 11-14 lirate denticles, columella narrowly weakly calloused and with 2-14 small denticles. White to fawn in colour, ornamented with irregular, dilacerated orange-brown markings and occasionally white and brown spots at sutures and a brown band on anterior of varix, aperture white. Operculum brown and simple at margins.

TYPE LOCALITY. Sth. Nilandu Atoll, Maldive Is, 2-66 m *(subtranslucidus)*; off Isshiki, Aichi Prefecture, Enshu-nada, Japan, *c.*50 m *(hayashii)*.

DISTRIBUTION. From the Maldive Is to N.W. Australia and Japan. In coral sand, subtidal to a depth of 69 m.

Type specimens. The holotype of *N.subtranslucidus* (E.A.Smith), is in the British Museum (N.H.), London, No.1903.9.17.41, length 8.0 mm, width 3.9 mm. The holotype of *Zeuxis hayashii* Habe, is in the National Science Museum, Tokyo, No.43866, length 11.7 mm, width 6.3 mm.

Material examined. SRI LANKA: Pal Strait, 10°02'N & 80°02'E, 22 m (AMS); INDONESIA: between Warbal and Ur I, W. of Nuhu Rowa, Kai Is, 59-62 m; 15 km S.W. of Tg Ratoe, Maikoor, Aru Is, 46 m; 24 km W. of Tg Lelar, Trangan Aru, 38-40 m; off Tg Tutuhuhur, Piru Bay, Ceram (all WAM); PHILIPPINES: off Sirun I, Tawi Tawi group, 31 m (USNM); AUSTRALIA: *c.*161 km W. of Cape Leveque, Western Australia, 16°18'S & 121°40'E, 69 m (AMS); JAPAN: off Isshiki, Enshu-nada, *c.*50 m (NSMT).

The species has been discussed and type-specimens illustrated by Cernohorsky (1980).

Nassarius (Zeuxis) pseudoconcinnus (E.A.Smith, 1895)
(Plate 31, figs.1-3)

1895. *Nassa pseudoconcinna* E.A.Smith, Ann.Mag.Nat.Hist. (9), 16:263.
1901. *Nassa (Niotha) sturtiana* Melvill & Standen, Proc.Zool.Soc.Lond. 2:413, pl.23,fig.14.
1901. *Nasa (Hima) pseudoconcinna* E.A.Smith, Melvill & Standen, *ibid.*, 2:414.
1928. *Nassarius (Hima) pseudoconcinnus* (E.A.Smith), Melvill, Proc.Malac.Soc.Lond. 18:106.

Shell up to 18.0 mm in length but frequently smaller, elongate-ovate, light in weight, teleoconch of 5-6½ convex whorls, protoconch of 3½ glassy, embryonic whorls; sculptured with numerous, slender axial ribs which continue all the way to the back of the outer lip and number from 30-45 on the penultimate and from 30-40 on the body whorl; spiral sculpture consists of finely incised spiral striae which are either short and confined to interspaces or may just ascend to the summits of the axial ribs, striae number from 5-12 on the penultimate and from 8-11 on the body whorl, followed by 7-11 slightly nodulose basal cords and 7-10 oblique cords on the siphonal fasciole, siphonal notch and anal canal distinct. Aperture moderately narrow, outer lip thickened but not strongly variced, interior with 9-11 lirate denticles, columella narrowly calloused and either obsoletely or distinctly minutely denticulate. White to fawn in colour, body whorl occasionally with 1-3 very faint orange-brown bands, columella and aperture white.

TYPE LOCALITY. off Gujerat, Arabian sea, 95 m *(pseudoconcinnus)*; Gulf of Oman, 24°55'N & 57°25'E, 68 m *(sturtiana)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf to India and Madagascar. In sand, subtidal to a depth of 450 m.

Type specimens. One syntype of *N.pseudoconcinnus* (E.A.Smith), is in the British Museum (N.H.), London, (no number), and this specimen, length 14.6 mm, width 7.8 mm, is here designated as the lectotype (pl.31, fig.1). The holotype of *Nassa sturtiana* Melvill & Standen, is in the same Institution (no number), length 18.0 mm, width 9.5 mm.

Material examined. RED SEA: Opposite marine laboratory, Eilat, Gulf of Aqaba, 400-450 m (TAU); INDIA: Bay of Bengal, 150 m (USNM); MADAGASCAR: off Madagascar, 12°34'S & 48°15'E, 395 m (Natal Mus.).

Nassarius (Zeuxis) roissyi (Deshayes in Bélanger, 1832)
(Plate 31, fig.5)

1832. *Buccinum roissyi* Deshayes in Bélanger, Voy.Ind.Orient.,Zool. p.432, pl.3,figs.3,4; 1834 Kiener, Spéc.gen.icon.coq.viv. 9:80, pl.21,fig.82.

Shell *c.* 15.0 mm in length, elongate-ovate, spire slender and pointed, teleoconch of 7 convex whorls, protoconch of 1¾ glassy, smooth embryonic whorls; sculptured with strong axial ribs which tend to be weaker and more slender on the body whorl; ribs number 21 on the penultimate and 20 on the body whorl; spiral sculpture consists of overriding spiral cords which produce slightly laterally elongated nodules upon the summits of axial ribs, cords number from 6-7 on the penultimate and 12 on the body whorl, siphonal fasciole with 5 oblique cords. Aperture moderately narrow, outer lip thickened but not varicose. edge of outer lip with bluntly spinose denticles, interior with 11 lirate denticles, columella narrowly and weakly calloused and with 3 small denticles anteriorly, parietal denticle distinct, siphonal notch distinct. Cream in colour, ornamented with some brown spots between ribs on upper spire whorls, body whorl with a pale yellow band, aperture white.

TYPE LOCALITY. Indian Ocean.

DISTRIBUTION. Unknown.

Type specimens. The holotype of *N.roissyi* (Deshayes in Bélanger), is in the Museum National d'Histoire Naturelle, Paris, length 15.3 mm, width 7.9 mm.

Absolutely nothing is known about this species, and apart from the holotype no other specimens have been seen.

Nassarius (Zeuxis) mammilliferus (Melvill, 1897)
(Plate 31, fig.4)

1897. *Nassa (Niotha) mammillifera* Melvill, Mem.Proc.Manchester Lit.Phil.Soc. 41:4.
1901. *Nassa (Hima) mamillifera (sic)* Melvill, Melvill & Standen, Proc.Zool.Soc.Lond. 2:414 (emended spelling).
1901. *Nassa (Hima) mamillifera* var. *hindarabica* Melvill & Standen, *ibid.*, 2:414.
1928. *Nassarius (Hima) mamilliferus* Melvill, Proc.Malac.Soc.Lond. 18:107.
1928. *Nassarius (Hima) mamilliferus* var. *pura* Melvill *ibid.*, 18:107 (non *Nassa pura* Marrat, 1877 = *Nassarius*).

Shell up to 12.0 mm in length, elongate-ovate, spire pointed, teleoconch of 4½-6¼ almost flat-sided whorls which are usually constricted at sutures, protoconch of 2½-2¾ milky-white embryonic whorls which occasionally have a fugitive carina; sculptured with thin axial ribs which continue to the back of the outer lip, ribs numbering from 20-27 on the penultimate and from 19-26 on the body whorl; spiral sculpture consists of overriding spiral cords which produce small, rounded nodules at the point of intersection, penultimate whorl with 3 rows of nodules viewed from the ventral side and 4 rows when viewed from the dorsal side, body whorl with 8-10 rows, siphonal fasciole with 4-8 oblique cords, interspaces of spiral cords with 1-3 finely incised intermediate striae, siphonal notch and anal canal distinct. Aperture small, outer lip thickened and strongly variced and with 6-8 denticles in interior, columella narrowly calloused and with 2-4 small denticles anteriorly. Uniformly white in colour, some individuals ornamented with 1 single orange-brown sutural band on spire whorls and 3 such bands on body whorl, aperture and columella white. Operculum brown and simple at margins.

TYPE LOCALITY. Persian Gulf *(mammilliferus)*; Hindarabi I, Persian Gulf, 46-92 m *(hindarabica)*; Henjam I, Persian Gulf (*pura* Melvill).

DISTRIBUTION. From the Persian Gulf to Pakistan. In sand and clay, usually subtidal to a depth of 92 m.

Type specimens. Two syntypes of *N.mammilliferus* (Melvill), are in the British Museum (N.H.), London, (no number), and the specimen measuring length 11.3 mm, width 6.0 mm, is here selected as the lectotype (pl.31, fig.4). The type specimens of the forms *hindarabica* and *pura* have not been located.

Material examined. PERSIAN GULF: 5 km S.E. of Bushire, 7 m; 12 km from Bushire; near Bushire, 28°45'N & 50°52'E, 15 m; 28°56'N & 50°46'E, 8 m; 28°46'N & 50°44'E, 28 m; 3 km W. of Ayanat, 27°43'N & 52°08'E, 7 m; 1 km E.S.E. of Tuwai, 23 m; N. of Kharg I, 8-18 m (all ZMC); Henjam I (AMS); PAKISTAN: (coll.Powell; coll.Marrow).

The species is somewhat similar to *N.roissyi* (Deshayes in Bélanger), but differs in having almost flat-sided, constricted whorls, thinner axial ribs, only 3 rows of nodules on the penultimate whorl and additional spiral striae in interspaces.

Nassarius (Zeuxis) frederici (Melvill & Standen, 1901)
(Plate 31, figs.6-9)

1877. *Nassa scalarina* Marrat, Prop.new forms genus *Nassa* p.12, pl.1,fig.17 (non S.V.Wood, 1872).
1897. *Nassa (Hima) townsendi* Melvill, Mem.Manchester Soc.Lt.Soc. 31(7):4, pl.6,fig.1 (non Dall, 1890).
1901. *Nassa (Hima) frederici* Melvill & Standen, Proc.Zool.Soc.Lond. 2:413 (nom.subst.pro *N.townsendi* Melvill, 1897).
1906. *Nassa (Hima) tindalli* Melvill, Proc.Malac.Soc.Lond. 7:29, textfig; 1916 Preston, Rec.Indian Mus.Calcutta 12:89.
1928. *Nassarius (Hima) frederici* Melvill & Standen, Melvill, Proc.Malac.Soc.Lond. 18:106.

Shell up to 15.0 mm in length but frequently smaller, teleoconch of 4¾-5¾ convex whorls, protoconch of 2¾-3 glassy, carinate embryonic whorls, sutures tabulate and weakly canaliculate, spire produced and longer than aperture; sculptured with moderately slender axial ribs which number from 17-30 on the penultimate and from 13-26 on the body whorl; spiral sculpture consists of finely incised spiral grooves or more prominent spiral threads, spirals either confined to interspaces or weakly bisecting axials, and numbering from 5-8 on the penultimate and from 11-14 on the body whorl, siphonal fasciole with 5-7 cords, sutural nodules ill-defined. Aperture narrow, outer lip thickened and variced, interior with 6-10 denticles, columella narrowly but prominently calloused, concave, and with a basal fold and 6-9 denticles, siphonal notch and anal canal prominent. White in colour, spire whorls with one very faint anterior and another posterior brown band, body whorl with 3 brownish bands, columella and aperture white, interior of aperture banded with brown.

TYPE LOCALITY. Mecran coast, Persian Gulf (*frederici* and *townsendi* Melvill); none (*scalarina* Marrat); Batticaloa, Sri Lanka *(tindalli)*.

DISTRIBUTION. From the Red Sea and the Persian Gulf to India and Vietnam. In sand, subtidal to a depth of 700 m.

Type specimens. Two syntypes of *N.frederici* (Melvill & Standen) [also types of *Nassa townsendi* Melvill], are in the British Museum (N.H.), London, No.1897.7.30.116-7, and the specimen measuring length 14.6 mm, width 7.4 mm, is here selected as the lectotype (pl.31, fig.6). The holotype of *Nassa tindalli* Melvill, is in the same Institution No.1906.7.12.1, length 12.8 mm, width 6.5 mm. Four syntypes of *N.scalarina* Marrat, are in the Merseyside County Museum, Liverpool, and the specimen measuring length 10.3 mm, width 5.6 mm, is here designated as the lectotype (pl.31, fig.7).

Material examined. RED SEA: Eilat, Gulf of Aqaba, 400-450 m; S. of Nuweiba, 550-700 m; Ras Taba, 690 m; S.E. of Ras Nasri, 560 m (all TAU); PERSIAN GULF: N. of Kharg I; 13 km N.E. of Kharg I, 22 m; 21 km W. of Bushire, 56 m; 21 km S. of Bustani, 65 m; 11 km E.N.E. of Patrick Stewart Bank, 69 m; 29°07'N & 49° 56'E, 40 m (all ZMC); INDIA: Indian Seas (ZSI); Kaup near Mangalore, west coast of India (coll.Whitehead); VIETNAM: (coll.Marrow).

Nassa tindalli has been based on a more slender form with slightly more prominent spiral cords.

Nassarius (Zeuxis) sinarus (Philippi, 1851)
(Plate 31, Figs.10,11; Plate 32, Fig.1)

1851. *Buccinum sinarum* Philippi, Zeit.f.Malakozool. 8:63.
1852. *Nassa semiplicata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107 (non *Buccinum semiplicatum* Costa, 1829 = *Nassarius*).
1942. *Zeuxis semiplicata* (A.Adams), Yen, Proc.Malac.Soc.Lond. 24:233,pl.23, fig.164 (figd.syntype).

Shell up to 17.0 mm in length, elongate-ovate, light in weight, teleoconch of 5½-6 convex and slightly inflated whorls, protoconch worn in specimens examined but apparently paucispiral; sculptured with slender axial ribs which number from 16-22 on the penultimate and from 11-13 on the body whorl, ribs tending to become obsolete on last dorsal half of body whorl; spiral sculpture consists of prominent, flattish spiral cords which are confined to the interspaces, and number from 7-9 on the penultimate and from 12-13 on the body whorl followed by 4-5 weakly nodulose cords and 4-6 cords on the siphonal fasciole, sutural nodules distinct. Aperture narrow, outer lip thickened and narrowly variced, interior with 6-7 denticles, columella with a narrow callus and 5-10 round denticles, siphonal notch distinct, anal canal very prominent. Off-white in colour, spire whorls ornamented with a posterior broader brown sutural band and a narrow band anterior to suture, body whorl with 3 moderately broad brown bands, anterior band usually weakly indicated. Aperture white, deep interior with brown bands. Operculum brown and simple at margins.

TYPE LOCALITY. Yong-tse-kiang, China *(sinarum)*; Chusan, China [= Chow-shan I, Chekiang] (*semiplicata* A.Adams).

DISTRIBUTION. Known only from China.

Type specimens. A syntype of *N.sinarus* (Philippi) is in the Dunker collection, Zoological Museum, Humboldt University, Berlin, length 17.0 mm. Three syntypes of *Nassa semiplicata* A.Adams, are in the British Museum (N.H.), London, No.1973147, and the specimen measuring length 16.0 mm, width 9.0 mm, is here selected as the lectotype (pl.32, fig.1).

Material examined. CHINA: Chow-shan I, Chekiang (BMNH); Amoy (coll.Steiner); Hongkong (USNM).

Nassarius (Zeuxis) clarus (Marrat, 1877)
(Plate 32, figs.2-4)

1853. *Nassa australis* A.Adams, Proc.Zool.Soc.Lond. for 1851, p.272; 1908 Hedley, Proc.Linn.Soc.N.S.W. 33:484, pl.8,fig.10 (figd.syntype) [non *Buccinum australe* Menke, 1843 = *Nassarius*].
1877. *Nassa clara* Marrat, Prop.new forms genus *Nassa* p.7.
1877. *? Nassa (Zeuxis) semiplicata* A.Adams, Brazier, Proc.Linn.Soc.N.S.W. 1:180 (non A.Adams, 1852).

Shell up to 26.0 mm in length, protoconch of 1¾-2 smooth, embryonic whorls, closely similar to *N.sinarus* (Philippi) but differs in the following features: the shell is more solid and consequently heavier in weight, whorls are less inflated, axial ribs coarser and thicker, sutural nodules more prominent, basal spiral cords more nodulose and axial ribs continue all the way to the back of the outer lip. White, cream or pale grey in colour, ornamented with 2 brown spiral bands on spire whorls and 2-3 bands on the body whorl, some individuals pale creamy-yellow and only with an interrupted central band on body whorl, columella and outer lip white, interior of aperture banded with greenish-brown. Operculum brown and simple at margins.

TYPE LOCALITY. None *(clarus)*; Australia (*australis* A.Adams).

DISTRIBUTION. From Thailand to Northern Australia. In sand, usually within the intertidal zone.

Type specimens. The worn, faded holotype of *N.clarus* (Marrat), is in the Merseyside County Museum, Liverpool, length 14.3 mm, width 8.3 mm. Three syntypes of *Nassa australis* A.Adams, are in the British Museum (N.H.), London, No.197313, and the specimen measuring length 25.6 mm, width 13.8 mm, is here selected as the lectotype (pl.32, fig.3).

Material examined. THAILAND: Koh Chang (ZMC); AUSTRALIA: West Australia: Shark Bay; Port Hedland; Carnarvon; Onslow area; N. side of Naval base, Exmouth; Princess Royal Harbour, Albany (all AMS); S.W. side of Northwest Cape; Noorea's reef, Regnard's Bay (both coll.Hansen); Dampier Salt (coll.Rutherford); Queensland: Townsville (Auckland Univ.).

The species is closely similar to *N.sinarum* (Philippi) from China, and the limited material of the latter species indicates subtle, constant differences. Further study of the two species is indicated.

Nassarius (Zeuxis) succinctus (A.Adams, 1852)
(Plate 32, figs.5-7)

1852. *Nassa succincta* A.Adams, Proc.Zool.Soc.Lond. Pt.19:107; 1853 Reeve, Conch.Icon. 8:pl.12, figs.80a,b; 1934 Mari, J.Conchyl. 78:42.
1870. *Zeuxis succincta* A.Adams, Ann.Mag.Nat.Hist. (4), 5:425.
1880. *Nassa pusilla* Marrat, Var.shells genus *Nassa* pp.54,82; 1940 Tomlin, Proc.Malac.Soc.Lond. 24(1):38 (non *Buccinum pusillum* Philippi, 1844 = *Nassarius*).
1961. *Zeuxis succinctus* (A.Adams), Habe, Col.Illust.shells Japan 2:64,pl.32, fig.21.
1982. *Nassarius succinctus* (A.Adams), Kaicher, Card.cat.world-wide shells, Pack No.31: card 3236.

Shell up to 20.0 mm in length but frequently smaller, elongate-ovate, spire pointed, shining, teleoconch of 5-6½ convex whorls, protoconch of 3 finely carinate embryonic whorls, sutures narrowly ledged; post-embryonic whorls sculptured with numerous slender axial ribs, a distinct row of sutural nodules and fine spiral striae in interspaces; last 1-2½ whorls almost devoid of sculpture with the exception of a weak subsutural groove, a few macroscopic spiral striae, 13-19 spiral threads on the back of the outer lip, 6-7 strong spiral cords towards lower half of body whorl and 7-8 oblique cords on the siphonal fasciole, siphonal notch and anal canal prominent. Aperture moderately narrow, outer thickened, narrowly strongly variced and with 7-9 strong denticles in interior, anterior edge of outer lip occasionally with a few small denticles, columella narrowly calloused, columellar denticles arranged geometrically in a row, parietal denticle distinct. White to fawn in colour, spire whorls with one anterior and one posterior brown band, body whorl with 3 bands, aperture white banded with orange-brown.

TYPE LOCALITY. Masbate, Philippines *(succinctus)*; Singapore, Malaysia (*pusilla* Marrat).

DISTRIBUTION. From Mozambique, East Africa to the Philippines and Japan. Subtidal, to a depth of 128 m.

Type specimens. Two syntypes of *N.succinctus* (A.Adams) are in the British Museum (N.H.), London, No.1973144, and the specimen measuring length 19.6 mm, width 9.2 mm, is here designated as the lectotype (pl.32, fig.5). The holotype of *Nassa pusilla* Marrat, is in the Merseyside County Museum, Liverpool, length 8.7 mm, width 4.6 mm.

Material examined. EAST AFRICA: between Inhaca and Zavora, Mozambique (Natal Mus.); INDONESIA: Amboina Bay, *c.* 128 m (ZMC); PHILIPPINES: Masbate I (BMNH).

Tomlin (1940) when reviewing Marrat's types of Nassariidae, considered Marrat's homonymous *N.pusilla* to be a small example of *Nassarius succinctus* and commented that he received similar specimens from Archer himself.

Nassarius (Zeuxis) idyllius (Melvill & Standen, 1901)
(Plate 32, figs.8-12)

1900. *? Nassa munda* Sturany, Anz.k.Akad.Wiss.math.-nat.Wien 17:200; 1903 Sturany, Denk.k.Akad.Wiss.math-nat.Wien 74:223, pl.2,figs.4a,b (nomen dubium).
1901. *Nassa (Alectryon) idyllia* Melvill & Standen, Proc.Zool.Soc.Lond. 2:410, pl.23,fig.12.
1911. *Nassa (Alectryon, Aciculina ?) ovoidea* Schepman, Siboga-Exped. 49d:316, pl.20,figs.1a,b (non Locard, 1886).
1915. *Arcularia caelata* var. *torresiana* Hedley, Proc.Linn.Soc.N.S.W. 39:734, pl.83, fig.76.
1928. *Nassarius (Alectrion) idyllius* (M. & St.), Melvill, Proc.Malac.Soc.Lond. 18:106.
1931. *Nassa (Alectryon) schepmani* Koperberg, Jaarb.Mijnw.Nederl.-Indie, Lief.7:103, pl.3,fig.40.
1935. *Nassarius (Alectrion) ovoideus* Schepman, Oostingh, Weten.Meded.Mijnb.Nederl.Indie No.26:73.
1939. *Nassarius (Hima) crebricostatus dilemensis* Oostingh, Ing.Nederl.-Indie Mijnb.Geol. 6(12):178, pl.16,fig.280.
1950. *Nassarius (Hima) ovoideus* (Schepman), Beets, Leidse Geol.Meded. 15:294.

Shell up to 12.0 mm in length but frequently smaller, elongate-ovate, conical, teleoconch of 4½-5½ convex whorls, protoconch of 2¾-3¼ glassy, finely carinate embryonic whorls; sculptured with moderately numerous, slender axial riblets which number from 16-24 on the body whorl and from 20-26 on the penultimate whorl; spiral sculpture consists of fine spiral striae, *c.* 5-6 on the penultimate and 8-10 on the body whorl followed by 5-6 nodulose cords, striae sometimes override axials giving them a slightly nodulose appearance, sutural nodules separated by a deeper subsutural groove; in some individuals the subsutural groove is very shallow. Aperture moderately small, outer lip thickened and variced and with 5-8 denticles within, columellar callus narrow, bordered and minutely denticulate, siphonal notch prominent. Usually uniformly cream to straw-yellow in colour, some specimens with a brown central band on body whorl, columellar callus and aperture white.

TYPE LOCALITY. Gulf of Oman, 24°55'N & 57°59'E, 68 m *(idyllius)*; S.E. of Akik Seghir, Red Sea, 17°26'N & 39°19'E, 332 m *(munda)*; Flores Sea, Indonesia, 8°27'S & 122°56.5'E, 247 m (*ovoidea* Schepman); Torres Strait, N. Australia, 22 m *(torresiana)*; Toi Oesapi Soka, Timor, Pliocene of Indonesia *(schepmani)*; Tjidilem, Sth. Bantam, Java, Pliocene of Indonesia *(dilemensis)*.

DISTRIBUTION. From the Persian Gulf to Madagascar, the Philippines and the Fiji Is. In coral sand, clay, mud and shell-debris, subtidal, from 5-320 m.

Type specimens. Two syntypes of *N.idyllius* (Melvill & Standen) are in the British Museum (N.H.), London, No.1901.12.9.158-159, and the adult specimen measuring length 11.0 mm, width 6.0 mm, is here selected as the lectotype (pl.32, figs.8,9). Syntypes of *Nassa ovoidea* Schepman, are in the Zoological Museum, University of Amsterdam, and the specimen measuring length 6.8 mm, width 3.9 mm, is here designated as the lectotype (pl.32, fig.11). Two syntypes of *N.torresiana* Hedley, are in the Australian Museum, Sydney, No.C-8072, and the specimen measuring length 5.3 mm, width 2.9 mm, is here selected as the lectotype (pl.32, fig.12). The type of *dilemensis* Oostingh, is probably in the Bandoeng Museum, Indonesia, the whereabouts of the type of *schepmani* Koperberg, are unknown to me, and the types of *N.munda* Sturany are missing from the collection of the Natural History Museum, Vienna (Dr. E.Wawra, *in litt.*).

Material examined. PERSIAN GULF: 3 km W. of Ayanat, 27°43'N & 52°08'E, 7 m; E.S.E. of Bustani, Iran, 27°05'N & 53°02'E, 5-9 m (both ZMC); MADAGASCAR: Tulear (SMOM); ANDAMAN IS: (ZSI); INDONESIA: Macassar Str., 1°25'S & 117°05'E, 50 m; S. of Bali, 8°26'S & 114°29'E, 70 m (both ZMC); PHILIPPINES: Arenas Pt., Luzon, 161 m; off Nagubat I, E. Mindanao, 81 m; Daram Channel, 59 m; off Sueste Pt., W. Luzon, 46 m (all USNM); FIJI IS: Momi Bay, W. Viti Levu, 27 m (USNM).

Fossil record. PLIOCENE: Kali Glagah, Boemiajoe, Java, Indonesia (Oostingh 1935); Tjidilem, Sth. Bantam, Java, Indonesia (Oostingh 1939); PLIO-PLEISTOCENE: Mandul I, E. Borneo, Indonesia (Beets 1950).

The taxon "*Nassa ovoidea* Schepman 1911" is used frequently in palaeontological literature on Indonesian fossils, however, Schepman's taxon is a primary homonym of *Nassa ovoidea* Locard, 1886.

Nassarius (Zeuxis) fufanus (Fischer in Wanner, 1927)
(Fig. 129)

1927. *Nassa (Niotha) fufana* Fischer in Wanner, Palaeont. v.Timor 15(25):71, pl.213, fig.42.

"The ovoid-acuminate form shows a similarity to *N.dijki* (K.Martin). The shell is more rotund and thus more similar to *N.ovum* (K.Martin). Differs from both these species by a protoconch of 2½ embryonic whorls; the following 3½ post-embryonic whorls are convex and clearly separated by an impressed suture, and sculptured with strong, straight or slightly oblique, close-set axial ribs which number 25 on the body whorl; the spiral striae in the interspaces are weak but on the last whorl the spiral sculpture is more regular and sharper; towards the base there are 4 wider, granulose spiral cords and the siphonal fasciole is also corded. Aperture small, rounded, outer lip with a strong varix, interior with 6 blunt denticles. Columella narrowly calloused and with 6 distinct denticles. The shell is holed on the ventral side of the body whorl.

The species differs from *N.dijki* in features of a differently formed protoconch, and the spiral sculpture in *N.ovum* is considerably more prominent." (Abridged translation).

TYPE LOCALITY. Seran I, Timor, Pliocene of Indonesia.

DISTRIBUTION.. Pliocene of Indonesia.

Type specimens. The location of the type of *N.fufanus* (Fischer in Wanner) is not known to me.

The species is closely similar to *N.idyllius* (Melvill & Standen), and the type, when found, should be compared with this species.

Nassarius (Zeuxis) ovum (K.Martin, 1880)
(Figs. 130,131)

1880. *Nassa ovum* K.Martin, Tertiaersch. Java p.35, pl.7,fig.1 only; 1915 Tesch in Wanner, Palaeont.v.Timor 5:61, pl.81,figs.135a,b; 1919 K.Martin, Palaeozool.Kennt.Java p.83; 1927 Fischer in Wanner, Paleont.v.Timor Lief.15(25):33.
1884. *Nassa (Zeuxis) ovum* K.Martin, Samml.geol.Reichs-Mus.Leiden (1), 3:121.
1895. *Nassa (Niotha) ovum* K.Martin, Samml.geol.Reichs-Mus.Leiden 1:108,pl.17, figs.242,242a,b, 243.
1935. *Nassarius (Alectrion) ovum* (K.Martin), Oostingh, Weten.Meded.Nederl.-Indie Mijub.Geol. No.26:74.
1939. *? Nassarius (Hebra) pasirensis* Oostingh, Ing.Nederl.-Indie Mijnb.Geol. 6(12):168, pl.15,figs.261,262.
1939. *Nassarius ovum* (K.Martin), Mukerjee, Mem.Geol.Surv.India, Palaeont.Indica, N.S. 28:60, pl.3,figs.8,9.

Shell up to 14.0 mm in length, ovate, teleoconch of 5-5½ whorls, protoconch of 3 embryonic whorls, sutures narrowly subcanaliculate; sculptured with prominent, slender axial riblets which continue all the way to the outer lip, ribs number *c.* 13 on the penultimate and 15 on the body whorl, axial ribs forming round nodules at sutures; spiral sculpture consists of very prominent, flattish spiral ribs which number from 6-7 on the penultimate and from 16-17 on the body whorl apart from 4-5 oblique cords on the siphonal fasciole. Aperture narrow, varix moderately broad and strong, interior with 7-8 denticles, columella narrowly calloused and with *c.* 10 small denticles, siphonal notch and anal canal prominent.

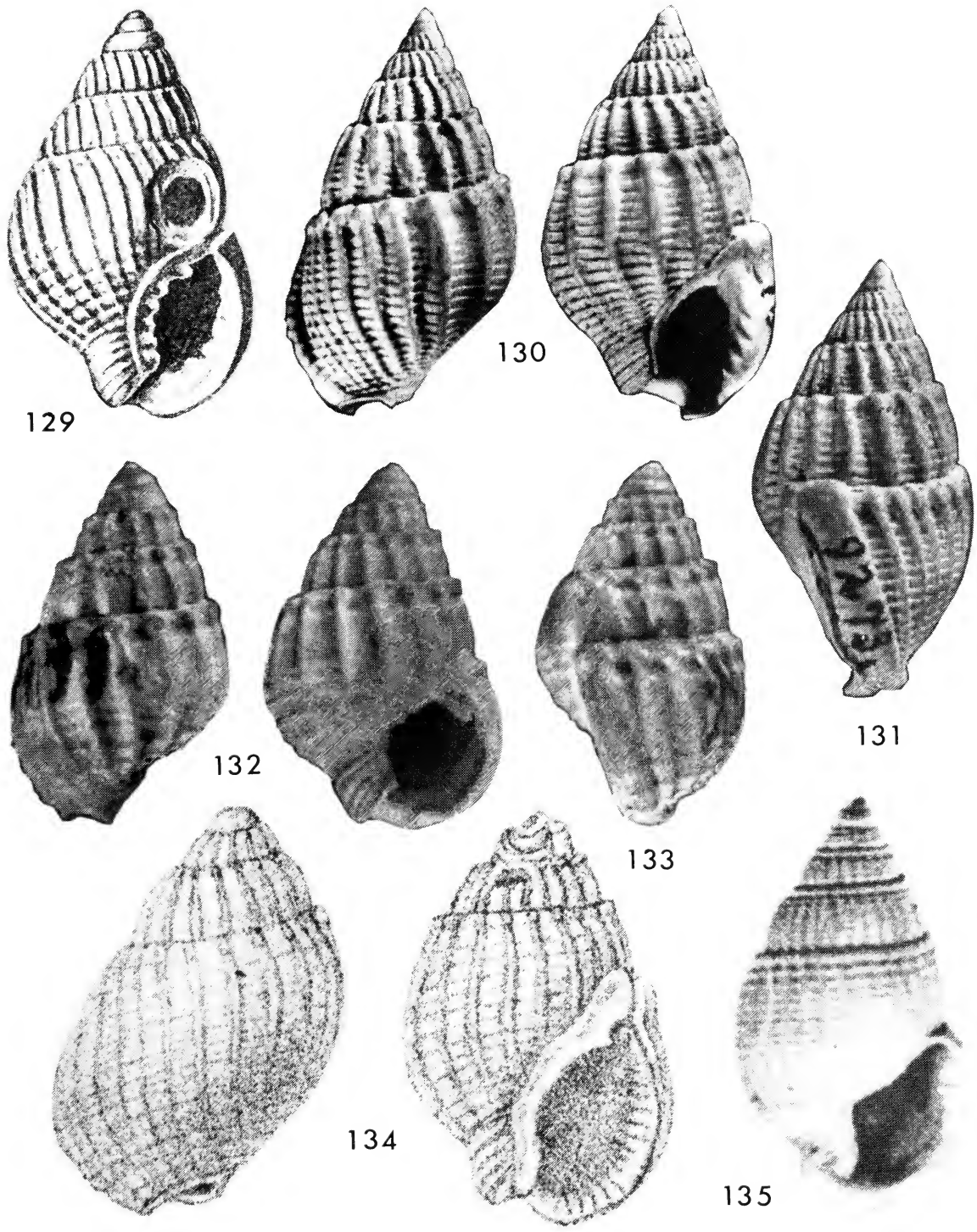
TYPE LOCALITY. Loc."O" = Bandong, Java, Indonesia. (Tjilintoeng, Preanger, Java, Upper Miocene of Indonesia, is the locality of the lectotype).

DISTRIBUTION. Upper Miocene of Indonesia and India and Pliocene of Indonesia.

Type specimens. Numerous syntypes of *N.ovum* (K.Martin), are in the Rijksmuseum van Geologie en Mineralogie, Leiden, and the specimen No.RGM-9273, length 12.8 mm, width 7.4 mm, is here selected as the lectotype (figs.130,131). This syntype has been suggested for lectotype selection by Dr. A.W.Jannsen (*in litt.*, 25-III-1975). The type of *N.pasirensis* Oostingh, is probably in the Museum of Bandoeng, Indonesia.

Fossil record. UPPER MIOCENE: Tjidamar, Preanger, Java, Indonesia (K.Martin 1884); Bagmora and Dalu, Garo Hills, Assam, India (Mukerjee 1939); PLIOCENE: Kassi Marinum Fialarang, Timor (K.Martin 1884); between Tjilintung and Angsanana, Karang district, Java; Djampangtengah, Java; Njalindeong, Java, all Indonesia (K.Martin 1895); Kampong Fatoekau, Fialarang; Niki Niki, Amoeban; Wai Oli near Pene, all Timor (Tesch in Wanner 1915); Akelamo valley, Obi I, Timor (Fischer in Wanner 1927); Kali Glagah; Kali Bioek; Boemiajoe, all Java (Oostingh, 1935).

Nassa ovum K.Martin, was originally a composite species and for this reason has been misunderstood by subsequent authors. Martin himself (1895) separated some of the original specimens under the new name *N.dijki.* The designation of a lectotype should help to stablise the nomenclature of this species.



Figs. 129-135. Fossil Nassariinae. 129. *Nassarius (Zeuxis) fufanus* (Fischer in Wanner). Type-figure (from Fischer in Wanner, 1927, pl.213,fig.42). 130,131. *N. (Z.) ovum* (K.Martin). Lectotype Rijksmuseum van Geologie en Mineralogie, Leiden RGM-9273; 12.8 mm. 132,133. *N. (Z.) dijki* (K.Martin). Lectotype Rijksmuseum van Geologie en Mineralogie, Leiden, RGM-9481; 5.4 mm (immature specimen). 134. *N. (Z.) ngawianus* (K.Martin). Type-figure; *c.* 18.0 mm (from K.Martin, 1895, pl.17, fig.241). 135. *N. (Z.) gerthi* (Koperberg). Type-figure; 7.3 mm (from Koperberg, 1931, pl.3, fig.42).

Nassarius (Zeuxis) dijki (K.Martin, 1895)
(Figs. 132,133)

1895. *Nassa (Niotha) dijki* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.F. 1:109, pl.17, figs.244,244a,b.
1919. *Nassa dijki* K.Martin, Paleozool.Kennt.Java p.83; 1931 van der Vlerk, Leidsche geol.Meded. 5:233.

Shell up to 6.0 mm in length, ovate, teleoconch of 3¼ convex whorls, protoconch of 3¼ embryonic whorls, last whorl carinate; sculptured with moderately wide-spaced, slender angulate axial ribs which number *c.* 10 on the penultimate whorl and 12-13 on the body whorl; spiral sculpture is absent except for a broad subsutural groove which separates sutural nodules and 5-6 rugose spiral cords on lower half of body whorl and 4-5 oblique cords on the siphonal fasciole. Aperture small, varix prominent, interior with 4 denticles, columella weakly and narrowly calloused and with 4 small and one parietal denticles, siphonal notch distinct.

TYPE LOCALITY. Borehole at Grissee, depth 616-645 m, Soerabaja, Java, Lower Miocene of Indonesia.

DISTRIBUTION. Miocene of Indonesia.

Type specimens. Three syntypes of *N.dijki* (K.Martin), are in the Rijksmuseum van Geologie en Mineralogie, Leiden, and the specimen No.RGM-9481, length 5.4 mm, width 3.5 mm, is here designated as the lectotype (Figs.132,133).

The species differs from *N.ovum* (K.Martin), in the absence of a spiral sculpture on the spire whorls and posterior half of the body whorl.

Nassarius (Zeuxis) macrocephalus (Schepman, 1911)
(Plate 33, figs.1,2)

1911. *Nassa (Alectryon) macrocephala* Schepman, Siboga-Exped. 49d:317, pl.20, figs.2a,b; 1927 Fischer in Wanner, Palaeont.v.Timor Lief.15(25):72.

Shell up to 5.0 mm in length, elongate-ovate, teleoconch of 2-3 weakly convex whorls, protoconch of 4¼-4½ shining fawn, carinate embryonic whorls; sculptured with regular, slender axial ribs which continue all the way to the outer lip; spiral sculpture consists of spiral striae which are usually weak on the first post-embryonic whorl and become quite distinct on the body whorl, back of varix with impressed spiral striae, anterior half of body whorl with overriding spiral threads, a shallow subsutural groove separates a discreet row of sutural nodules. Aperture narrow, back of outer lip thickened and prominently variced, interior with 5-6 denticles, columella narrowly calloused and with 4-6 minute denticles and a parietal denticle, siphonal notch and anal canal distinct. Uniformly creamy-fawn in colour throughout.

TYPE LOCALITY. Kwandang Bay Entrance, Indonesia, 75 m.

DISTRIBUTION. From Indonesia to the China Sea and North Australia. In fine sand and dark green mud, subtidal to 414 m.

Type specimens. Syntypes of *N.macrocephalus* (Schepman) are in the Zoological Museum, University of Amsterdam, and the specimen measuring length 4.5 mm, width 2.7 mm, is here selected as the lectotype (pl.33, fig.1).

Material examined. INDONESIA: Java Sea, 8°26'N & 114°29'E, 70 m (ZMC); Buton Strait, Celebes, 68 m (USNM); PHILIPPINES: off Sombrero I, Balayan Bay, 216 m; off N.Ticao I, 414 m at 11°C; Manila Harbour, Luzon; S. off Corregidor, 65 m; Palawan group; Leyte (all USNM); Samar, 92 m (coll.Norton); CHINA: off Pratas I, China Sea, 381 m at 10°C (USNM); AUSTRALIA: *c.* 152 km N. of Coburg Peninsula, Arafura Sea, 9°45'S & 132°04'E, 108 m (AMS).

Fossil record. PLIOCENE: Akelamo valley, Obi I, Timor, Indonesia (Fischer in Wanner 1927).

The species is closely related to *N.dijki* (K.Martin, 1895) from the Java Miocene.

Nassarius (Zeuxis) ngawianus (K.Martin, 1895)
(Fig. 134)

1895. *Nassa (Niotha) ngawiana* K.Martin, Samml.geol.Reichs-Mus.Leiden,N.S. 1:107, pl.17,figs.241,241a,b; 1927 Fischer in Wanner, Palaeont.v.Timor Lief. 15(25):72, pl.213,fig.43.

"Shell acuminate-ovate, *c.* 18.0 mm in length, with a short body, embryonic whorls not preserved. Whorls separated by a shallow suture and sculptured with numerous, small, sharp and sometimes curved axial ribs, and numerous fine spiral striae in interspaces, spirals confined to interspaces, subsutural groove absent. Aperture elongate-ovate, outer lip not thickened, interior with 17 sharp lirae, columella narrowly calloused and with a few small wrinkles, siphonal notch, anal canal and parietal denticle distinct". (Abridged translation).

TYPE LOCALITY. Ngawi, Gendingan district, Sonde, Java, Pliocene of Indonesia.

DISTRIBUTION. Unknown.

Type species. The single incomplete holotype of *N.ngawianus* (K.Martin), can no longer be located at the Rijksmuseum van Geologie en Mineralogie, Leiden (Dr. A.W.Janssen, *in litt.*).

Nassarius (Zeuxis) crebricostatus (Schepman, 1911)
(Plate 33, figs.3-8)

1900. *? Nassa sporadica* Sturany, Anz.k.Akad.Wiss.math.-nat.Wien 17:201; 1903 Sturany, Denk.k.Akad.Wiss.math.-nat.Wien 74:224, pl.2,figs.5a,b.
1911. *Nassa (Alectryon, Aciculina) crebricostata* Schepman, Siboga-Exped. 49d:318, pl.20,figs.3a,b.
1930. *Nassarius (Hima) beccarii* Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:61, textfigs.7,8.
1931. *Nassa kampeni* Koperberg, Jaarb.Mijnw.Ned.-Indie Lief.7:105, pl.3,fig.41.
1982. *Nassarius crebricostatus* (Schepman), Cernohorsky, Rec.Auckland Inst.Mus. 19:139, figs.41-45 (shell), fig.48 (radula) [figd.type specimens of *N.crebricostatus* and *N.beccarii*].

Shell up to 16.0 mm in length but frequently smaller, ovate, light in weight, teleoconch of 3½-5 convex and slightly inflated whorls, protoconch of 3-3½ glassy, carinate embryonic whorls; sculptured with usually numerous, slightly irregular, thin axial ribs which are either continuous to the outer lip or become obsolete on body whorl towards the varix, ribs number from 30-53 on the penultimate and from 25-45 on the body whorl, axial ribs frequently weak and irregular on early spire whorls; spiral sculpture consists of fine or prominent spiral striae which number from 9-17 on the penultimate and from 18-38 on the body whorl, basal striae becoming rugose cords, siphonal fasciole with 5-9 oblique cords, sutures with a row of small nodules. Aperture moderate in size, outer lip thickened and broadly variced, interior with 5-16 denticles in mature individuals, columella narrowly calloused and with 2-13 small denticles, siphonal notch weak, anal canal moderately distinct in adult individuals. Uniformly off-white, fawn to straw-yellow in colour, some specimens with 2-3 brownish bands on body whorl and some individuals have the axial ribs stained with brown. Operculum yellowish-brown and simple at margins.

TYPE LOCALITY. Molucca Passage, Indonesia, 0°11'S & 127°25'E, 397 m *(crebricostatus)*; Red Sea, 24°48'N & 35°25'E, 535 m *(sporadica)*; Dilemmi, Red Sea *(beccarii)*; Niki Niki, Timor, Plio/Pleistocene of Indonesia *(kampeni)*.

DISTRIBUTION. From the Red Sea to Madagascar, the Andaman Is and the Tuamotu Archipelago. In mud, subtidal to a depth of 472 m.

Type specimens. Syntypes of *N.crebricostatus* (Schepman) are in the Zoological Museum, University of Amsterdam, and the mature syntype, length 6.7 mm, width 4.0 mm, is here selected as the lectotype (pl.33, fig.4). The holotype of *N.beccarii* Bisacchi, is in the Museo Civico de Storia Natural, Genoa, length 11.0 mm. The type of *Nassa sporadica* Sturany, could not be located in the Natural History Museum, Vienna (Dr. E.W.Wawra *in litt.*), and the taxon remains a *nomen dubium*. The type of *N.kampeni* Koperberg, is probably in the Geology Department, University of Amsterdam.

Material examined. RED SEA: Aden (NMV); MADAGASCAR: off Madagascar, 12°34'S & 48°15'E, 395 m (Natal Mus.); ANDAMAN IS: (ZSI); INDONESIA: Sanana Bay, E. coast of Sulu Besi, 22 m (ZMA); off Pendek I, Buton Str., Celebes, 393 m (USNM); Java, 7°29'S & 114°49'E, *c.* 240 m (ZMC); PHILIPPINES: Tanon Str., off Refugio I, 472 m at 17°C (USNM); 13°32'N & 121°07'E, 130-137 m (MNHNP); Balayan Bay, Luzon, 392 m (USNM); off Arcua Pt., Luzon, 234 m (coll.Norton); AUSTRALIA: Northern Territory: Arafura Sea, *c.* 161 km N. of Croker I, 9°30'S & 132°34'E, 124 m; Queensland: Capricorn Channel, 23°08'S & 152°16'E, 155 m; E. of Northwest I, 23°15'S & 152°24'E, 284 m; 30 km E. of North reef, 23°11'S & 152°14'E, 188 m (all AMS); PAPUA NEW GUINEA: Laing I, Hansa Bay, 65 m (coll.Tursch).

Nassarius (Zeuxis) gerthi (Koperberg, 1931)
(Fig. 135)

1931. *Nassa (Alectryon) gerthi* Koperberg, Jaarb.Mijnw.Ned.-Indie, Lief.7:106, pl.3, fig.42.

"Shell with 3½ embryonic whorls and a very small sunken nucleus, last 2 embryonic whorls carinate, sutures with a subsutural groove and a row of small nodules; sculptured with 21-23 axial ribs per whorl. Post-embryonic whorls with 3-4 spiral threads, later whorls with 7-11 spirals; body whorl with 36 axial ribs, siphonal fasciole with *c.* 7 spiral cords. Aperture pear-shaped to ovate, and with a distinct anal canal and parietal fold. Canal short, siphonal notch rounded, interior of aperture with 6-8 lirae, outer lip thickened by a varix. Callus weak, lightly laminate and with a few denticles. Some specimens are broader and the axial ribs are denser, however, this difference is unimportant.

The species is closer to *N.crebricostatus* (Schepman), but this species differs by having a rounder aperture and a more slender shape. Number of whorls (inclusive of protoconch) 7¼". (Abridged translation).

TYPE LOCALITY. Toi Oesapi Soka, Timor, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type of *N.gerthi* (Koperberg), is probably in the Geology Department, University of Amsterdam. The original dimensions were length 7.3 mm, width 3.8 mm.

The illustrated type specimen appears to be immature. It closely resembles some individuals of *N.crebricostatus* (Schepman).

Nassarius (Zeuxis) olomea Kay, 1979
(Plate 33, figs.9-11)

1979. *Nassarius olomea* Kay, Bernice, P.Bishop Mus.Spec.Publ. 64(4):274, fig.95E.

Shell up to 16.0 mm in length, elongate-ovate, light in weight, teleoconch of 5-5¼ convex whorls, protoconch of 3-3½ glassy embryonic whorls, last one finely carinate, sutures ledged; sculptured with fine, slender and occasionally arcuate axial ribs which number from 30-32 on the penultimate and from 22-23 on the body whorl; spiral sculpture consists of prominent, numerous, close-set spiral threads numbering from 11-13 on the penultimate and from 23-27 on the body whorl, a subsutural groove cuts through axials and produces a row of sub-echinate sutural nodules, siphonal fasciole with 6-8 oblique cords. Aperture moderately open, outer lip narrowly variced, interior with *c.* 15 denticles, anterior 2 denticles usually larger and sometimes fused, columella narrowly calloused and with a few obsolete denticles, siphonal notch and anal canal prominent, anterior of outer lip longer than siphonal canal. Cream in colour, axial ribs tinged with brown.

TYPE LOCALITY. Mamala Bay, Oahu, Hawaiian Is.

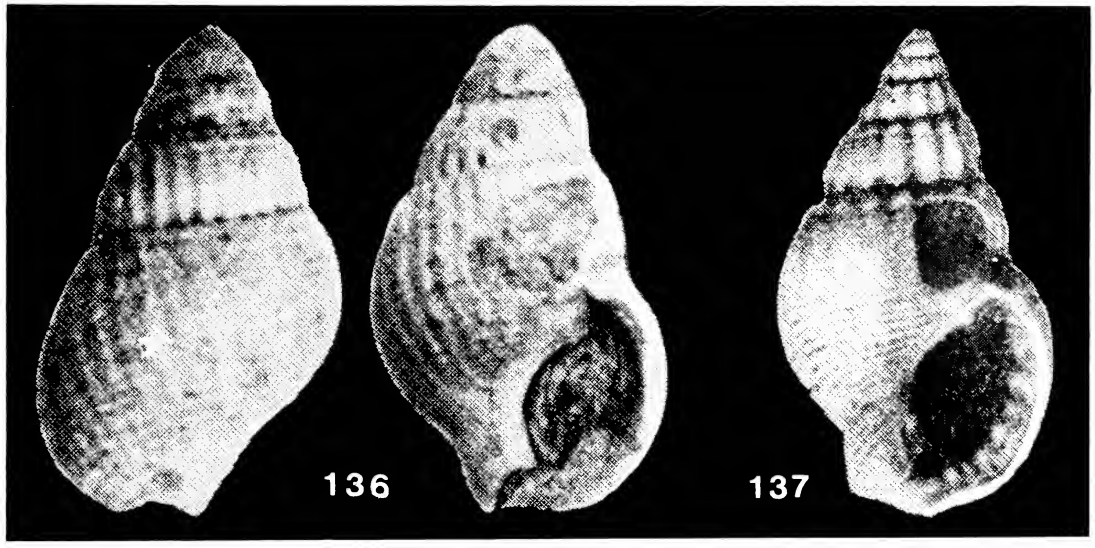
DISTRIBUTION. To date known only from the Hawaiian Islands. Subtidal, to a depth of 386 m.

Type specimens. The holotype of *N.olomea* Kay, is in the Bernice P.Bishop Museum, Honolulu, No.9802, length 14.8 mm, width 8.2 mm.

Material examined. HAWAIIAN IS: off Keehi lagoon, Oahu, 182 m (coll.Cross & Bratcher); Pailolo Channel, Maui, 232 m at 19°C; Sth. coast of Oahu, 97-386 m at 9°C (both USNM).

Nassarius (Zeuxis) kometubus Otuka, 1934
(Fig. 136)

1934. *Nassarius (Zeuxis) kometubus* Otuka, Bull.Earthquake Res.Inst.Tokyo Imp.Univ. 12:631, pl.51,figs.109,110a,b; 1952 Hatai & Kotaka, Short Pap.Inst.Geol.Paleont.Tohoku Univ.Sendai No.4:71.
1979. *Zeuxis kometubus* (Otuka), Taguchi, Ono & Okamoto, Bull.Mizunami Foss.Mus. No.6:8, pl.4,fig.14; 1981 Itoigawa et al., Mon.Mizunami Foss.Mus. No.3a:pl.38, figs.6a,b, 7a,b; 1982 Itoigawa et al., *ibid.* No.3b:231.



Figs. 136,137. Fossil Nassariinae. 136. *Nassarius (Zeuxis) kometubus* Otuka. Type-figure; 4.0 mm. 137. *N. (Z.) simizui* Otuka. Type-figure; 10.0 mm (both after Otuka, 1934, pl.51,figs.109,110 and pl.50,fig.85 respectively).

"Shell globose, granulated. Spire conic, a half shell height with a blunt apex. Protoconch of 3 smooth, convex whorls, turreted, gradually increasing. Later whorls about 3, convex, sculptured with 9 spiral cords separated by narrower interspaces, disposed in suboblique axial ribs, the ribs 26 in number on the penultimate whorl. Their interspaces wider than themselves; the subsutural cord with a wide excavated groove in front. Body whorl convex, contracted below, wtih 18-19 spiral cords. Suture impressed but not canaliculated. Fasciole defined with a deep spiral groove, with four spiral sculptures. Aperture ovate; with a short broad reflected canal below. Outer lip convex, varicose, smooth within. Columella smooth, short and concave, obliquely truncate below". (Original description).

TYPE LOCALITY. Siratori, Iwate Prefecture, Lower Kadonosawa series, Lower Miocene of Japan.

DISTRIBUTION. Lower Miocene of Korea and Lower to Middle Miocene of Japan.

Type specimens. The location of the type specimens of *N.kometubus* Otuka, is probably in the Geology Institute, Imperial University of Tokyo. The original dimensions were length 4.0 mm, width 2.5 mm.

Nassarius (Zeuxis) simizui Otuka, 1934
(Fig. 137)

1934. *Nassarius (Hinia) simizui* Otuka, Bull.Earthquake Res.Inst.Tokyo Imp.Univ. 12:631, pl.50,figs.85-87.
1979. *Reticunassa simizui* (Otuka), Taguchi, Ono & Okamoto, Bull.Mizunami Foss.Mus. No.6:8, pl.4,figs.12,13; 1981 Itoigawa et al., Mon.Mizunami Foss.Mus. No.3A:pl.38,figs.8a,b; 1982 Itoigawa et al., *ibid.*, No.3B:230.

"Shell narrowly ovate, stout, cancellated. Spire subturreted, almost equal in height with the aperture, conic in outline with an angle of about 50°. Nucleus whorls of 3½ smooth, convex whorls, turreted, slowly increasing. Later whorls 5, slightly convex, sculptured with 7½ spiral cords, separated by narrower sulcae, the subsutural one broadest and more or less granulose, and the upper second cords more or less finer than the others. Suboblique axial ribs, 18 in number on the penultimate whori, their interspaces wider than themselves. Body whorl convex, contracted below, with 13-14 spiral cords. Lower ten of which are arranged with broader interspaces on the base than the upper cords. Subsutural area distinctly bounded by the subsutural cord like shouldered shell. Fasciole defined with a shallow groove, with 5 oblique lines upon the surface. Aperture elongate ovate, oblique, slightly channeled above and with a short deep reflected canal below. Outer lip varicose, with internal lirations which number more than 11; inner lip with a sharply delimiting callus deposit on which 2 upper unequal and 2 lower denticles are folded". (Original description).

TYPE LOCALITY. Siratori, Iwate Prefecture, Lower Kadonosawa series, Lower Miocene of Japan.

DISTRIBUTION. Lower to Middle Miocene of Japan.

Type specimens. The type specimen of *N.simizui* Otuka, is probably in the Geological Institute, Imperial University of Tokyo. The original dimensions were length 10.0 mm, width 5.5 mm.

Nassarius (Zeuxis) tabescens (Marrat, 1880)
(Plate 33, figs.12,13)

1880. *Nassa tabescens* Marrat, Var.shells genus *Nassa* pp.74,81.
1982. *Nassarius tabescens* (Marrat), Cernohorsky, Rec.Auckland Inst.Mus. 19:141, figs.46,47 (shell), fig.49 (radula), figs.50,51 (embryo).

Shell up to 8.0 mm in length, elongate-ovate, shining, sometimes with a translucent golden sheen, teleoconch of 3-4¾ convex whorls, first 2 post-embryonic whorls sub-angulate, protoconch of 3-3¼ glassy, carinate embryonic whorls; sculptured with strong, thick axial ribs which are usually fewer in number and wider spaced on the upper spire whorls, and number from 9-14 on the penultimate and from 10-14 on the body whorl; spiral sculpture consists of fine, flattish spiral threads in interspaces which number from 4-8 on the penultimate and from 9-11 on the body whorl, in addition to 2-4 stronger spiral cords at base, siphonal fasciole with 5-6 oblique cords; a subsutural groove separates a row of narrow, laterally oriented nodules. Aperture small, outer lip thickened and broadly variced, interior with 8-12 small denticles, columella narrowly calloused and with 5-8 small denticles, siphonal notch and anal canal distinct. White to translucent golden-brown, ribs and varix white, spire whorls ornamented with 2 reddish-brown bands anterior and posterior to sutures, body whorl with 3 such bands, lower half of varix frequently with 2 reddish-brown blotches, aperture white, base of outer lip sometimes with a reddish-brown stain. Operculum brown in colour and either simple or finely serrate on one or both margins.

TYPE LOCALITY. None.

DISTRIBUTION. From Indonesia to the Society Is. In coral sand, fine grey sand and mud, subtidal to a depth of 91 m.

Type specimens. The holotype of *N.tabescens* (Marrat), is in the Merseyside County Museum, Liverpool, length 7.0 mm, width 4.0 mm.

Material examined. INDONESIA: Haingsisi, Samau I, Timor; Bay of Bima, near South Fort, 55 m; Madura Bay, 61-91 m (all ZMA); PAPUA NEW GUINEA: Laing I, Hansa Bay, 35 m (coll.Tursch); SOCIETY IS: Mahina, Baie de Matavai and Mataiea, both Tahiti, 12 m (coll.Trondle).

Cernohorsky (1982a) reported the species to be ovoviviparous. The real distribution of the species remains unknown and no type locality has been designated for this reason.

Nassarius (Zeuxis) disparilis (E.A.Smith, 1903)
(Plate 34, figs.1,2)

1903. *Nassa disparilis* E.A.Smith, Fauna & Geog.Maldive & Laccadive Archip. 2:607, pl.35,fig.12.
1908. *Nassa jucunda* Preston, Rec.Indian Mus. Calcutta 2(2):194, pl.14,fig.8.

The species is closely similar to *N.tabescens* (Marrat) in size, shape and sculpture. It appears to differ only in two diagnostic characters, both of which may be of a transient nature. The first 2 post-embryonic whorls are sub-angulate in *N.tabescens* but are distinctly convex in *N.disparilis*, and the antepenultimate and penultimate whorls are also more strongly convex than in *N.tabescens*. *N.disparilis* has a white, shining shell with only a faint, narrow, brown central band on the body whorl.

TYPE LOCALITY. South Nilandu Atoll, Maldive Is, Indian Ocean, 2-66 m *(disparilis)*; Andaman Is, 13-18 m *(jucunda)*.

DISTRIBUTION. Known only from the Indian Seas. Subtidal to a depth of 66 m.

Type specimens. The holotype of *N.disparilis* (E.A.Smith), is in the British Museum (N.H.), London, No.1903.9.17.28, length 7.4 mm, width 4.2 mm. The holotype of *Nassa jucunda* Preston, is in the Zoological Survey of India, Calcutta, No.4012/1, length 5.0 mm, width 2.6 mm.

Apart from the type specimens, no other material has been seen. The relationship between *N.tabescens* and *N.disparilis*, requires further study.

Nassarius (Zeuxis) celebensis (Schepman, 1907)
(Plate 34, figs.3-7)

1907. *Nassa celebensis* Schepman, Samml.geol.Reichs-Mus.Leiden (1), 8:176, pl.11, figs.3,3a.
1930. *Nassa minutula* Thiele, Fauna Suedwest-Australiens 5:584, pl.4,fig.59.
1977. *Nassarius (Niotha) marshallensis* Ladd, U.S.Geol.Surv.Prof.Pap. 533:55, pl.18,figs.6,7.
1981. *Nassarius minutulus* (Thiele), Cernohorsky, Rec.Auckland Inst.Mus. 18:188, figs.92-94.

Shell up to 9.0 mm in length, biconic-ovate, solid, teleoconch of 4¼-5 convex whorls, protoconch of 3-3¼ glassy embryonic whorls, last one feebly carinate; sculptured with prominent, broad and angulate axial ribs, ribs continue to the outer lip or become obsolete a short distance before the varix and number from 11-21 on the penultimate and from 8-21 on the body whorl, interspaces narrow; spiral sculpture consists of fine, minutely punctate spiral grooves, grooves sometimes weak or obsolete on spire whorls, numbering from 0-8 on the penultimate and from 8-10 on the body whorl, lower third of body whorl with additional 5-8 stronger spiral cords, siphonal fasciole with 8-9 oblique cords, suture with a subsutural groove which separates a row of usually narrow sutural nodules. Aperture narrow, outer lip thickened and variced, interior with 5-8 denticles, columella narrowly callused and with 3-5 minute denticles, siphonal notch and anal canal prominent. White in colour, spire whorls with 1-3 orange-brown spiral lines, body whorl with an interrupted or continous central brown line, a darker, broader band at base and occasionally brown spots in interspaces at sutures; some individuals have additional orange-brown spiral lines, varix sometimes with 1-2 brown blotches, aperture white.

TYPE LOCALITY. Kajoeragi, Menado, Celebes, Quaternary of Indonesia *(celebensis)* Sharks Bay, S.W. Australia *(minutula)*; drill-holes at Enewetak, Miocene of the Marshall Is *(marshallensis)*.

DISTRIBUTION. From Indonesia to the Philippines, Northern Australia and the Fiji Is. In sand and shell-debris, subtidal to a depth of 200 m.

Type specimens. The holotype of *N.celebensis* (Schepman), is in the Rijksmuseum van Geologie en Mineralogie, Leiden, No.RGM-102.440, length 6.8 mm, width 3.7 mm. The lectotype of *Nassa minutula* Thiele, is in the Zoological Museum, Humboldt University, Berlin, length 6.3 mm, width 3.4 mm. The holotype of *Nassarius marshallensis* Ladd, is in the National Museum of Natural History, Washington, No.USNM-175063, length 7.9 mm, width 4.2 mm.

Material examined. PHILIPPINES: Punta Engano, Mactan I, Cebu, 200 m (coll.Marrow); PAPUA NEW GUINEA: Manubada I, off Port Moresby (AMS); AUSTRALIA: West Australia: off Denham, Sharks Bay, 7 m; S. of Exmouth Gulf town; Dirk Hartog I, Shark Bay; Direction I, off Onslow; Vansittart Bay; Onslow jetty; Dongara near Geraldton; 3 km W. of Carnarvon, 8 m; Broome; Geraldton; Roebuck Bay, Broome (all AMS); Noorea's reef, Regnard Bay; W. side of Northwest Cape (both coll.Hansen); Northern Territory: mouth of Liverpool river; Loe Point, Darwin; 36 km off Point Charles, Darwin, 27-37 m; Groote Eylandth, Gulf of Carpentaria (all AMS); Darwin (coll.Hansen); Queensland: Forsyth I; Quoin I, Port Curtis; Amity Pt., Stradbroke I, Moreton Bay (all AMS); Sweers I (coll.Seely); FIJI IS: Main Suva reef, Viti Levu (coll.Northgrove); S. of Cave I, Suva Bay (ZMC).

Nassarius (Zeuxis) plicatellus (A.Adams, 1852)
(Plate 34, figs.8-10)

1852. *Nassa nivea* A.Adams, Proc.Zool.Soc.Lond. Pt.19:110; 1853 Reeve, Conch.Icon. 8:pl.18, figs.122a,b; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43.
1852. *Nassa plicatella* A.Adams, Proc.Zool.Soc.Lond. Pt.19:111; 1853 Reeve, Conch.Icon.8:pl.9, figs.56a,b; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43; 1959 Barnard, Ann.Sth.Afric.Mus.45:114; 1969 Barnard, Ann.Sth.Afric.Mus.47:627; 1973 Kensley, Sea-shells South Africa p.162, fig.603.
1884. *Nassa (Tritia) nivea* A.Adams Tryon, Man.Conch.4:57, pl.17,fig.326.
1884. *Nassa (Tritia) plicatella* A.Adams, Tryon, *ibid.*, 4:58, pl.17,fig.335.
1903. *Nassa (Caesia) plicatella* A.Ad., v.Martens, Wiss.Ergeb.deut.Tief.Exped."Valdivia" 7:9.
1923. *Nassa angolensis* Odhner, Goteb.K.Vet.Handl. 26:14, pl.1,figs.6,7.
1928. *Nassarius plicatellus* (A.Adams), Tomlin, Ann.Sth.Afric.Mus. 25:323.
1959. *Nassa scopularca* Barnard, Ann.Sth.Afric.Mus. 45:120, fig.24a; 1969 Barnard, Ann.Sth.Afric.Mus. 47:627; 1973 Kensley, Sea-shells South.Africa p.162, fig.605.

Shell up to 30.0 mm in length, elongate-ovate, teleoconch of 4½-5 slightly convex to almost flat-sided whorls, protoconch usually worn, but of 1½ smooth embryonic whorls; sculptured with few or more numerous axial ribs which number from 12-18 on the penultimate and from 13-24 on the body whorl, ribs somewhat thickened at sutures and producing obsolete sutural nodules; interspaces narrow or wide, sculptured with close-set, flattish spiral cords which become rugose basally and number from 7-10 on the penultimate and from 16-20 on the body whorl, siphonal fasciole short and broad and with a few oblique cords. Aperture moderately narrow, thickened but not prominently variced, interior with 15-16 lirate denticles, columella narrowly calloused, laminate anteriorly, sometimes with a basal fold and with 2-5 small denticles and a prominent parietal denticle, siphonal notch and anal canal prominent. Uniformly white to creamy-white in colour.

TYPE LOCALITY. Wallwich Bay [= Walvis Bay], S.W. Africa *(plicatella)*; Batangas Bay, Luzon I, Philippines, 38 m = error! *(nivea)*; Port Alexander, S. Angola, 24 m *(angolensis)*; shore of lagoon, Sth. of Bogenfels, Late Tertiary of S.W. Africa *(scopularcus)*.

DISTRIBUTION. From southern Angola, S.W. Africa to Port Alfred, South Africa. From the intertidal zone to a depth of 35 m.

Type specimens. Two syntypes of *N.plicatellus* (A.Adams), are in the British Museum (N.H.), London, No.1973157, and the specimen measuring length 24.4 mm, width 13.7 mm, is here selected as the lectotype (pl.34, fig.8). Three syntypes of *Nassa nivea* A.Adams, are in the same Institution, No.1973156, and the specimen measuring length 23.3 mm, width 12.9 mm, is here designated as the lectotype (pl.34, fig.9). The types of *N.angolensis* Odhner, are in the Natural History Museum, Goeteborg, and the worn, juvenile holotype of *N.scopularca* Barnard, is in the South African Museum, Cape Town, No.A-9230, length 14.4 mm, width 7.7 mm.

Material examined. SOUTHWEST AFRICA: Walvis Bay (BMNH; USNM); SOUTH AFRICA: Port Alfred (USNM).

Literature records. ANGOLA: Port Alexander, 24 m (Odhner, 1923); Mossamedes Bay, 15-20 m; Mossamedes Beach; Praya-Amelia Bay, 15-35 m (all Dautzenberg 1912); Great Fish Bay (Barnard 1959); SOUTHERN AFRICA: Angra Pequena; Table Bay; Saldanha Bay (all Barnard 1959).

Barnard (1969) changed his concept of "*N.scopularca* Barnard, 1959". He reported the species as still living at Langebaan, Saldanha Bay, and stated that it was questionable whether the Bogenfels clays really were as old as Late Tertiary, and suspected that *scopularca* may eventually be shown to be a mere variant of *N.plicatellus*.

Nassarius (Zeuxis) reussi (K.Martin, 1880)
(Figs. 138,139)

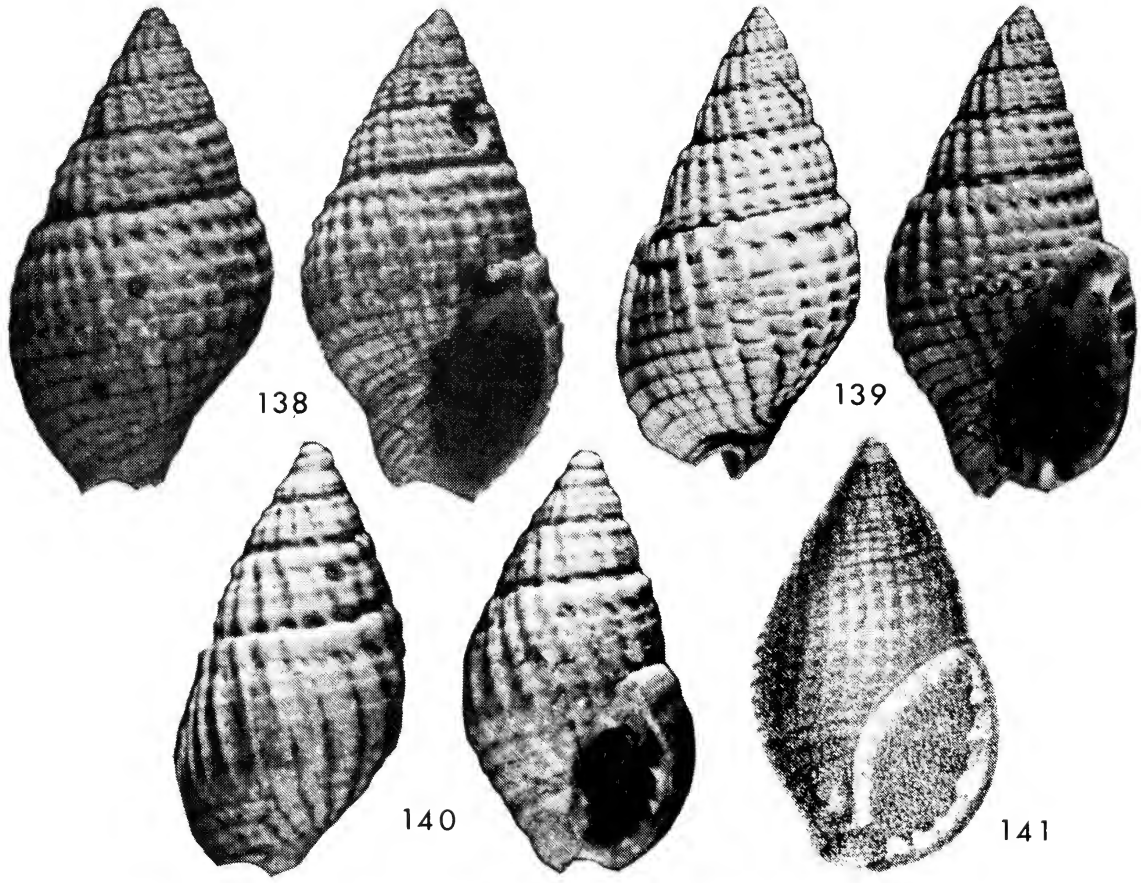
1880. *Nassa reussi* K.Martin, Tertiaersch.Java p.36, pl.7,figs.3,3a,b; 1919 K.Martin, Palaezool.Kennt.Java p.83.
1921. *Nassa (Niotha) angsanana* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S., 1:461, pl.59,figs.40,40a.

Shell up to 15.0 mm in length, elongate-ovate and slightly acuminate, teleoconch of 5-5½ weakly convex whorls, protoconch of 2 smooth embryonic whorls, sutures narrowly channeled; sculptured with slender, numerous axial ribs which continue to the back of the outer lip and number from 14-21 on the penultimate and from 18-24 on the body whorl; spiral sculpture consists of spiral cords which are either well developed in interspaces or override axial ribs and give rise to step-like nodules upon the summits; early spire whorls with a row of sutural nodules, but on later whorls sutural nodules often merge with the general sculpture, siphonal fasciole with strong oblique cords. Aperture moderately narrow, outer lip thickened and variced, interior with 7-9 strong denticles, columella narrowly calloused and slightly spreading above parietal wall and with 5-7 denticles, siphonal notch distinct, anal canal prominent.

TYPE LOCALITY. Localities K, O and C, Java, Miocene of Indonesia. Here restricted to locality "K", the origin of the lectotype *(reussi)*; Tji Angsana, Njalindoeng beds, Java, Upper Miocene of Indonesia *(angsanana)*.

DISTRIBUTION. Miocene of Indonesia.

Type specimens. Only 3 syntypes (out of 10) of *N.reussi* (K.Martin) remain in the Rijksmuesum van Geologie en Mineralogie, Leiden, No.RGM-9266, and two specimens have a broken apex while one specimen is immature. The complete, immature syntype, length 9.2 mm, width 4.9 mm, is here designated as the lectotype (fig.138). Only one syntype (out of 13) of *Nassa angsanana* (K.Martin),



Figs. 138-141. 138,139. *Nassarius (Zeuxis) reussi* (K.Martin). 138. Immature lectotype Rijksmuseum van Geologie en Mineralogie, Leiden, RGM-9266; 9.2 mm. 139. Lectotype of *Nassa angsanana* K.Martin, RGM-9541; 13.8 mm. 140. *N. (Z.) talahabensis* (K.Martin). Lectotype Rijksmuseum van Geologie en Mineralogie, Leiden, RGM-9545; 7.8 mm. 141. *N. (Z.) nuceus* (Pease). Type-figure; 12.0 mm (from Pease, 1869, pl.8,fig.7).

remains in the same Institution, No.RGM-9541, length 13.8 mm, width 7.2 mm, and this specimen is here designated as the lectotype (fig.139).

Dr.W.A.Janssen *(in litt.)*, suggested that Martin's (1880) original illustration may have been a composite drawing of the juvenile individual with an incomplete aperture and the broken specimens with an adult aperture. It is probable, however, that the illustrated specimen may have been among the seven specimens which are missing.

Nassarius (Zeuxis) talahabensis (K.Martin, 1921)
(Fig. 140)

1921. *Nassa (Niotha) talahabensis* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S., 1:462, pl.59,figs.41,41a.

"A small acuminate-ovate shell in which the length of the aperture is about half of the total length. Protoconch with only 1½ whorls, early whorls centrally angulate, sculptured with continuous, slightly oblique sharp axial ribs; spiral threads override axials and form sharp nodules at the point of intersection. The body whorl is covered by regular axial ribs and spiral cords which give the shell a somewhat clathrate appearance. Aperture elongate-oviform with a distinct anal canal and a deep siphonal notch, outer lip thickened and variced, interior with *c.* 4-5 denticles, columella narrowly calloused and with a few denticles and a prominent parietal fold.

Similar to *N.reussi* (K.Martin), but this species lacks the centrally angulate spire whorls, the sculpture is more dense and the columella more concave. The sculpture is reminiscent of *N.beberkiriana* which is easily separated from *N.talahabensis* by its considerably more slender shape and expanding callus-shield of the latter species". (Abridged translation).

TYPE LOCALITY. Tji Talahab and Tji Angsana, Java, Upper Miocene of Indonesia. Here restricted to Tji Talahab, Njalindoeng beds, Java, Upper Miocene of Indonesia, the origin of the lectotype.

DISTRIBUTION. Miocene of Indonesia.

Type specimens. Two syntypes of *N.talahabensis* (K.Martin), are in the Rijksmuseum van Geologie en Mineralogie, Leiden, No.RGM-9545, and the syntype from Tji Talahab, length 7.8 mm, width 4.3 mm, is here selected as the lectotype (Fig. 140).

Nassarius (Zeuxis) nuceus (Pease, 1869)
(Fig. 141)

1869. *Nassa nucea* Pease, Americ.J.Conch. 5:70, pl.8,fig.7.

"Shell stout, heavy, ovate; spire short, convex; whorls flatly convex, decussated throughout by longitudinal ribs and transverse grooves; ribs small, close-set and slightly curved; last whorl convex, more than one-half the length of the shell, and grooved at base; whorls narrowly marginate at the suture; aperture oblong-ovate, columella and outer lip strongly ridged, lip varicose on its outer edge; canal broad; wholly dark reddish-brown. Length 12.0 mm, width 7.0 mm.

The above is an unusual form for a tropical species. I know of none with which it can be compared". (Original description).

TYPE LOCALITY. Caroline Is, Pacific Ocean.

DISTRIBUTION. Unknown.

Type specimens. Not found.

Despite the moderately detailed description, passable illustration and exact locality data, the species has defied identification. The type of *N.nuceus* (Pease) has not been located, and the name remains a *nomen inquirendum*.

Nassarius (Zeuxis) abyssicolus (A.Adams, 1852)
(Plate 35, figs.1-3)

1852. *Nassa abyssicola* A.Adams, Proc.Zool.Soc.Lond. Pt.19:100.

Shell up to 14.0 mm in length but frequently smaller, ovate, body whorl slightly inflated, solid, teleoconch of 4¾-6 convex whorls, protoconch of 3+ worn, embryonic whorls, sutures weakly indicated; sculptured with almost equal-sized axial riblets and bisecting spiral threads which produce a sculpture of small, regular nodules, sculpture on body whorl less nodulose, spiral threads visible as striae in interspaces; nodules are arranged in 38-40 axials and 6-8 spirals on the penultimate and 30-35 axials and 15-18 spirals on the body whorl, siphonal fasciole with 7-10 oblique cords, a slightly deeper subsutural groove separates a row of sutural nodules. Aperture narrow, outer lip thick and broadly variced, interior of aperture with 6-7 strong denticles, third denticle anterior to the anal canal

larger than the rest, columella narrowly calloused, concave, lower third twisted towards aperture, and with 5-9 prominent denticles and a strong parietal fold, siphonal notch and anal canal prominent. Uniformly cream to pale yellow in colour.

TYPE LOCALITY. Loay I, Bohol I, Philippines, 110 m.

DISTRIBUTION. From the Philippines to the Hawaiian Is. Subtidal, to a depth of 110 m.

Type specimens. The holotype of *N.abyssicolus* (A.Adams), is in the British Museum (N.H.), London, No.197310, length 7.7 mm, width 4.1 mm.

Material examined. PHILIPPINES: Loay I, Bohol, 110 m (BMNH); HAWAIIAN IS: Sand I, Oahu (coll.Haas).

Apart from the holotype from the Philippines, only specimens from the Hawaiian Is have been seen.

Nassarius (Zeuxis) alfuricus (Fischer in Wanner, 1927)
(Plate 35, figs.4,5)

1927. *Nassa (Hima) alfurica* Fischer in Wanner, Palaeont.v.Timor, Lief.15(25):73, pl.213, figs.46a,b.

Shell up to 6.0 mm in length, closely similar to *N.abyssicolus* (A.Adams) in form and sculpture, teleoconch of 3½-4¼ convex whorls, protoconch of 3½-3¾ glassy, carinate embryonic whorls. Sculpture as granulose as in *N.abyssicolus* but much finer, and arranged in 40-45 axials and 5-6 spirals on the penultimate and 32-42 axials and 12-14 spirals on the body whorl, siphonal fasciole with 7-8 oblique cords. Aperture similar to *N.abyssicolus*, the third denticle anterior to the anal canal also has the tendency to be larger than the two posterior ones. White to light brown in colour, broad varix occasionally paler, aperture light orange-brown. Periostracum opaque to moderately translucent and a pale straw-yellow in colour.

TYPE LOCALITY. Akelamo valley, Obi I, Timor, Pliocene of Indonesia.

DISTRIBUTION. From Indonesia to the Philippines and Papua New Guinea. In green and grey mud, subtidal to a depth of 68 m.

Type specimens. The location of the type-specimen of *N.alfuricus* (Fischer in Wanner) is not known to me. The original dimensions were length 6.0 mm.

Material examined. INDONESIA: Buton Str., Celebes, 68 m (USNM); PHILIPPINES: off Panabutan Pt., W.Mindanao, 49 m (USNM); PAPUA NEW GUINEA: near Yule I, (coll.Hoetter); Laing I, Hansa Bay, 36 m (coll.Tursch).

The species is closely similar to *N.abyssicolus* (A.Adams), and differs only in its smaller size, lighter weight and finer sculpture. Further material of both species is required before *N.alfuricus* can be accepted as a valid bio-species.

Nassarius (Zeuxis) noguchii (Habe, 1958)
(Plate 35, fig.6)

1958. *Zeuxis noguchii* Habe, Venus:Jap.J.Malac. 20:34,42, textfig.14; 1961 Habe, Col.Illust.shells Japan 2:64, pl.32,fig.16; 1964 Habe, Shells West.Pacific col. 2:100, pl.32,fig.16.

Shell up to 16.0 mm in length, ovate and slightly inflated, teleoconch of 4 distinctly convex whorls, protoconch of 3 smooth embryonic whorls, sculptured with very slender axial riblets which continue to the outer lip and number *c.* 30 on the penultimate and 34 on the body whorl; spiral sculpture consists of 5-6 deep grooves on the penultimate whorl and 15 flattish spiral threads on the body whorl, anterior 6-7 cords granulose, a deep subsutural groove separates sutural nodules, siphonal fasciole with a few oblique cords. Aperture moderately narrow, outer lip convex and only moderately thickened, interior with 9-11 denticles, columella with a narrow callus and 4-5 small denticles and a basal fold, siphonal notch distinct, anal canal weak. Uniformly white in colour, with a slightly decorticated surface.

TYPE LOCALITY. Enshu Nada, Honshu, Japan.

DISTRIBUTION. To date known only from Japan. Subtidal to a depth of 200 m.

Type specimens. The holotype of *N.noguchii* (Habe) is in the National Science Museum, Tokyo, No.NSMT-38612, length 15.3 mm, width 10.0 mm.

Literature records. JAPAN: Tosa Bay, Shikoku (Habe, 1958).

Apart from the 2 type-specimens, no other material has been seen.

Nassarius (Zeuxis) nakayamai (Habe, 1958)
(Plate 35, fig.7)

1958. *Zeuxis nakayamai* Habe, Venus:Jap.J.Malac. 20:34,42; 1961 Habe, Col.Illust.shells Japan 2:64, pl.32,fig.17; 1964 Habe, Shells West.Pacific col. 2:100, pl.32,fig.17.

Shell *c.* 12.0 mm in length, elongate-ovate, less inflated than *N.noguchii* (Habe), teleoconch of 4½ convex whorls, protoconch of 3 glassy, carinate embryonic whorls; sculptured with numerous, irregular axial threads which continue to the outer lip, numbering *c.* 44 on the penultimate and the same number on the body whorl; sculptured with fine spiral striae which number *c.* 8 on the penultimate and 19 on the body whorl, striae weak in the central area of the body whorl, 6-7 basal striae becoming stronger cords, and a slightly deeper subsutural groove separates a row of oblique sutural nodules. Aperture narrow, outer lip only moderately thickened, interior with 13 lirate denticles, columella narrowly calloused but slightly spreading anteriorly and becoming concave and slightly recurved at this point, columella with 7 weak denticles, parietal denticle distinct, siphonal fasciole with 7-8 oblique cords, siphonal notch and anal canal prominent. Uniformly straw-yellow in colour.

TYPE LOCALITY. Tosa Bay, Shikoku, Japan, *c.* 100 m.

DISTRIBUTION. To date known only from Japan. Subtidal to a depth of *c.* 100 m.

Type specimens. The holotype of *N.nakayamai* (Habe), is in the National Science Museum, Tokyo, No.NSMT-39780, length 12.0 mm, width 7.1 mm.

Fossil record. PLEISTOCENE: Moeshima, Kagoshima Bay, Japan (Habe 1958).

Nassarius (Zeuxis) exstincteliratus (Fischer in Wanner, 1927)
(Fig. 142)

1927. *Nassa (Zeuxis) exstinctelirata* Fischer in Wanner, Palaeont.v.Timor Lief. 15(25):76, pl.213, figs.48a,b.
1931. *Nassa exstinctelirata* Fischer, van der Vlerk, Leidsche geol.Meded.5:233.

"Shell to 21.0 mm in length, in general appearance like *"N.picta* Dunker" from post-Tertiary deposits of Grissee, Java. The following differences characterise the fossil from Seran as a good species: there are 3½ finely carinate embryonic whorls and 6 whorls of the teleoconch. Shell only spirally striate at the base and fasciole, remaining surface smooth, with only a few fine, arcuate growth-striae. Embryonic whorls fairly ventricose, mature whorls at first moderately flat but later also convex, whorls separated by a narrowly channeled suture. Body whorl ventricose and with only the smallest trace of spiral sculpture; aperture elongate-ovate and with a well-developed anal canal, columella narrowly calloused and with wrinkles and folds, outer lip not thickened, interior with 14 lirate denticles, anterior edge of outer lip with 6 small denticles, siphonal canal broadening". (Abridged original description).

TYPE LOCALITY. Seran I, Timor, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The location of the type-specimens of *N.exstincteliratus* (Fischer in Wanner) is not known to me.

Nassarius (Zeuxis) sundaicus Oostingh, 1939
(Fig. 143)

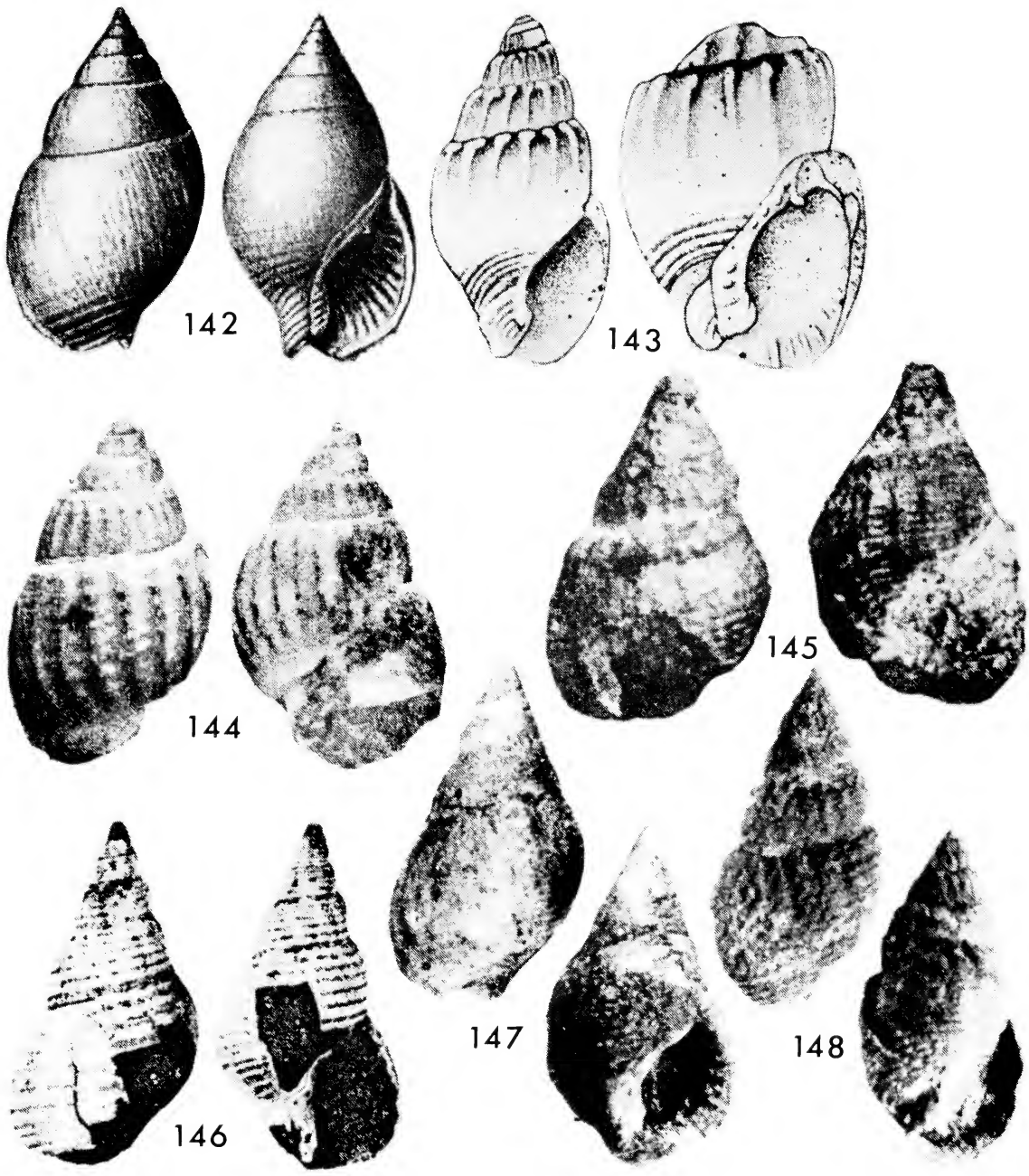
1939. *Nassarius (Zeuxis) sundaicus* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):182, pl.16,figs.283-285.

"Shell up to 12.5 mm in length, very shining, ovate, spire produced. Protoconch globose, consisting of 3 smooth whorls and a minute nucleus. Post-embryonic whorls number 4½ and are separated by a linear suture. Sculptured with slender axial ribs, *c.* 17-22 per whorl, interspaces about twice the width of the ribs, ribs form weak nodes on the presutural ramp. On the body whorl axial ribs extend only for a short distance towards the base. Body whorl more than two-thirds of total shell-length, base with about 5 spiral cords, siphonal fasciole short and with 4-5 oblique cords. Outer lip weakly variced, interior with 14 lirate denticles, columella concave and with a moderately narrow callus, and with numerous small denticles and wrinkles and a weak parietal fold". (Abridged translation).

TYPE LOCALITY. *C.* 825 m south of Tjiliman, *c.* 650 m east of Tjoeroeglanglang, Tjipatjar beds, Sth.Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The immature holotype of *N.sundaicus* Oostingh, is probably in the Museum of Bandoeng, Indonesia. The original dimensions were length 8.75 mm, width 4.5 mm.



Figs. 142-148. Fossil Nassariinae. 142. *Nassarius (Zeuxis) exstincteliratus* (Fischer in Wanner). Type-figure; 21.0 mm (from Fischer in Wanner, 1927, pl.213,fig.48). 143. *N. (Z.) sundaicus* Oostingh. Type-figure on left 8.75 mm. Close-up of aperture of mature specimen on right (from Oostingh, 1939,pl.16,figs. 283,284). 144. *N. (Z.) tunetoyoensis* Nomura & Hatai. Type-figure; 9.7 mm. (from Nomura & Hatai, 1936, pl.17,fig.12). 145. *N. (Z.) denselineatus* (Nagao). Type-figure; *c.*21.0 mm (from Nagao, 1928,pl.17,fig.14). 146. *N. (Z.) demissus* (Yokoyama). Type-figure; 14.5 mm (from Yokoyama, 1923,pl.2,fig.9). 147. *N. (Z.) pseudodemissus* Nomura & Zinbo. Type-figure; 17.0 mm (from Nomura & Zinbo, 1935, pl.15,fig.33). 148. *N. (Z.) incongruus* Otuka. Type-figure; 16.2 mm (from Otuka, 1937, pl.3,figs.8,9).

Nassarius (Zeuxis ?) tunetoyoensis Nomura and Hatai, 1936
(Fig. 144)

1936. *Nassarius (Alectrion) tunetoyoensis* Nomura & Hatai, Saito Ho-on Kai Mus.Res.Bull. No.10:138, pl.17,figs.12a,b.

"Shell small, globular, cancellated, slightly higher than long, with a short conical spire; body whorl large, swollen, longer than the spire. Nuclear whorls decollated. Post-nuclear whorls four, convex around the middle, shouldered at the summit, area between the shoulder and suture narrowly terraced. Suture impressed but not channeled or canaliculated. Surface marked by longitudinal ribs as well as spiral cords. Ribs narrow, subvertical, more or less curved, twenty upon the last whorl, separated by much wider interspaces; cords rather regularly disposed, five upon the penultimate whorl with narrower grooves, about ten upon the last whorl with nearly equal grooves in breadth on the upper part and wider ones on the lower. Intersecting points of ribs and cords are somewhat granular. Subsutural band not much prominent, being defined in front of shoulder by a shallow, rather broad sulcus. Siphonal fasciole distinct, but apparently having no deep groove behind. Aperture ovate, longer than spire; canal short, oblique and recurved, widely open; interior of aperture and inner lip unknown." (Original description).

TYPE LOCALITY. Nisigoto, N.E. Honsyu, Tanagura beds, Miocene of Japan.

DISTRIBUTION. Miocene of Japan.

Type specimens. The type-specimen of *N.tunetoyoensis* Nomura & Hatai, is presumably in the Saito Ho-on Kai Museum, original dimensions length 9.7 mm, width 6.0 mm.

Nassarius (Zeuxis ?) denselineatus (Nagao, 1928)
(Fig. 145)

1928. *Nassa (Hinia ?) denselineata* Nagao, Sci.Rept.Tohoku Imp.Univ.Sendai (2), Geol. 12:111, pl.17,figs.14,14a.

"Shell moderate in size, rather short; spire relatively small in height, shorter than the body whorl, with its apical angle about 40°; suture distinct, canaliculated and bounded by a granulated spiral band; spire-whorls approximately 6 in number, each flatly convex, somewhat cancellated by spiral striae and longitudinal ribs; spiral striae fine, numbering 6 on the penultimate whorl; longitudinal ribs about 20 in number, low, rounded but sometimes acute on top, and alternated with concave interspaces as broad as, or slightly broader than the ribs themselves. Body whorl large, swollen, convex at the sides, inflated and prominently granulated at the posterior margin, broadly and distinctly excavated below this granulated band, distinctly cancellated elsewhere; spiral striae numerous, fine, and crowded, longitudinal ribs rather low. Anterior part of the body whorl much injured; aperture elongated, anterior canal broken and the columella partly preserved." (Original description).

TYPE LOCALITY. Asakawa, Shimago-mura, Onga-gun, Kyushu I, province of Chikuzen, Yamaga beds, Oligocene of Japan.

DISTRIBUTION. Oligocene of Japan.

Type specimens. The type-specimen of *N.denselineatus* (Nagao), is presumably in the Tohoku Imperial University, Sendai, original dimensions length *c.* 21.0 mm, width 12.0 mm.

The specimen is badly preserved and apertural features are incomplete, and an assignment of the species to the Nassariidae is only tentative.

Nassarius (Zeuxis ?) demissus (Yokoyama, 1923)
(Fig. 146)

1923. *Nassa (Hima) demissa* Yokoyama, J.Coll.Sci.Imp.Univ.Tokyo 45:10, pl.2, figs.8,9.
1926. *Nassa (Hima) demissa* Yokoyama, J.Fac.Sci.Imp.Univ.Tokyo 1:339.
1937. *Nassarius demissus* (Yokoyama), Nomura, Jap.J.Geol. & Geog. 14:76.

"The shell is small, ovate in shape and provided with about six whorls of which the first two are embryonal and smooth; the succeeding ones are convex, separated by deep sutures and longitudinally as well as spirally sculptured. The longitudinal sculpture consists of fine threads, more or less sinuous, rather distant and present in great numbers. The spiral sculpture consists of flat cords, six or seven on the penultimate whorl and more than fifteen on the ultimate, usually close together except near the upper suture where they may be rather distant, the valleys between being usually narrower. Aperture ovate. Canal short and bent". (Original description).

TYPE LOCALITY. Dainichi, Totomi, Pliocene of Japan.

DISTRIBUTION. Pliocene of Japan.

Type specimens. The type-specimens of *N.demissus* (Yokoyama) are presumably in the Geological Institute, Imperial University of Tokyo. The original dimensions were length 14.5 mm, width 7.5 mm.

Nassarius (Zeuxis ?) pseudodemissus Nomura and Zinbo, 1935
(Fig. 147)

1935. *Nassarius (Caesia) pseudodemissus* Nomura & Zinbo, Saito Ho-on Kai Mus.Res.Bull.Sendai 6:179, pl.15,figs.33a,b.

"Shell rather small, ovate, consisting of about seven to eight whorls. Spire conical, pointed, slightly shorter than the length of aperture and canal; the upper-most two whorls nuclear and smooth; the rest convex around the middle, more or less shouldered at the summit, and marked by longitudinal plicae numbering about fourteen in a whorl, separated by wider interspaces; plicae entirely confined in the immature shells (upper two or three whorls) and become obsolete in the later ones which are provided with a single rather broad varix in each whorl. Spiral grooves distinct, about fourteen to seventeen appear upon the last whorl and five to eight upon the penultimate whorl, separated by wider, flat-topped interspaces except at the base where grooves and interspaces are nearly equal in breadth. Suture narrowly canaliculated with ill-defined subsutural area. Aperture ovate, pointed above, rounded below, connecting into a short, broad, reflected canal. Outer lip thickened by a terminal varix, transversely lirate or dentate within; inner lip smooth with a rather thin and broad callosity whose lower margin is occasionally free from the whorl-surface. Columella short, concave in the middle, obliquely truncated below, with a rather distinct, oblique, basal fold." (Original description).

TYPE LOCALITY. Yanagawa, Hukusima Basin, N.E. Honsyu, Miocene of Japan.

DISTRIBUTION. Miocene of Japan.

Type specimens. The holotype of *N.pseudodemissus* Nomura & Zinbo, is in the Saito Ho-on Kai Museum, Sendai, No.6186, length 17.0 mm, width 9.3 mm.

Nassarius (Zeuxis ?) incongruus Otuka, 1937
(Fig. 148)

1929. *Nassa (Niotha) incongrua* Yokoyama, J.Fac.Sci.Imp.Univ.Tokyo 2:364 (nomen nudum).
1937. *Nassarius (Hima) incongruus* Otuka, Jap.J.Geol. & Geog. 14:26, pl.3, figs.8,9.

"Shell elongate-ovate, apical angle sharp, number of whorls about 9 in the holotype; nuclear two whorls smooth rounded; post nuclear whorls onamented with spiral sculptures and longitudinal ribs; on body whorl, one broad subsutural cord, on which a few spiral striae are visible, there being about 16 regular spiral cords; between subsutural cord and top of regular spiral cords a broad groove with a fine spiral striae is sculptured. Subsutural cord forms nodules at points intersecting longitudinal ribs; longitudinal ribs more than 16 in number, obsolete on lower half of body whorl. On penultimate whorl, spiral sculptures consist of a nodulous subsutural cords with one groove and seven regular spiral cords. Between subsutural cord and regular cords broadly interspaced. Number of longitudinal ribs on penultimate whorl about 20. Height of aperture shorter than one-half of shell-length. Inner side of outer lip ornamented with horizontal teeth, which number about 17. Columellar side of the aperture with one tooth near upper corner of aperture, the lower part of which is obsolete by weathering of specimens and defined by a callus lamellae from basal surface. Subsutural area forms a shoulder forming a spiral groove." (Original description).

TYPE LOCALITY. Sendiyoziki, Yamada, Tongane beds, Miocene of Japan.

DISTRIBUTION. Miocene and Pliocene of Japan.

Type specimens. The holotype of *N.incongruus* Otuka, is in the Geological Institute, Imperial University of Tokyo, length 16.2 mm, width 8.1 mm.

Nassarius (Zeuxis) pulvinaris (von Martens, 1881)
(Plate 35, fig.10)

1881. *Nassa (Venassa) pulvinaris* v.Martens, Conch.Mittheil. 2:109, pl.22, figs.1-4; 1975 Cernohorsky, Rec.Auckland Inst.Mus. 12:222, fig.25.

"Shell elongate-conical, somewhat umbilicate, and with more or less nebulous axial ribs, pale red with narrow, brownish spiral bands, 9 whorls, the upper 3-4 whorls small, distinctly ribbed, slightly convex, the following 3-4 whorls more strongly convex, almost smooth, body whorl with some oblique axial ribs, basally almost flattened, base with a small, round, wege-like umbilicus. Aperture only one-third of shell-length, trigonal, widening basally interior with 8-10 lirate denticles. Columella thickened and folded outward and with a distinct fold and two smaller folds posteriorly." (Abridged translation).

TYPE LOCALITY. Atapupu, Timor, Indonesia.

Type specimens. The holotype of *N.pulvinaris* (v.Martens), is in the Zoological Museum, Humboldt University, Berlin, length 23.0 mm, width 14.0 mm.

Cernohorsky (1975b) discussed the genus-group *Venassa* in detail, and concluded that the type-species *N.pulvinaris* has been based on malformed individuals of a *Nassarius (Zeuxis)* species. This malformation is characterised by an accelerated growth, with sutures dipping more obliquely and the shell assuming a considerably more fusiform shape. The distortion is most pronounced on the body whorl which becomes more elongate and usually roundly angulate in its anterior third. Malformation is apparent in the distortion of the aperture with the outer lip twisted and oriented obliquely to the axis, a distorted and often exaggerrated columellar callus and a twisted siphonal fasciole. The usually distinct parietal denticle becomes indistinct and the columella becomes edentulous. Such malformed individuals occur more frequently in the Nassariidae than any other neogastropod group, and when encountered, should be recognised for what they are, i.e. teratological aberrants.

Subgenus **Varicinassa** Habe, 1946

Varicinassa Habe, 1946, Venus:Jap.J.Malac. 14:193. Type species by M *Nassarius (Varicinassa) variciferus* (A.Adams) = *Nassa varicifera* A.Adams, 1852. Recent, Sino-Japanese region.

The type-species of the subgenus *Varicinassa* Habe, i.e. *Nassarius variciferus* (A.Adams), very closely resembles *N.(Zeuxis) scalaris* (A.Adams), and has been separated from the *Zeuxis* group on the single feature of prominent angulate varices on whorls.

During a study of 181 specimens of the S.E. Australian *Nassarius (Niotha) nigellus* (Reeve, 1854), it was found that 4.5% of specimens examined also had a varix on the body whorl, which may have been caused by retarded growth and longer rest-periods in some individuals in Nassariidae populations from more temperate waters. It is not known if *N.variciferus* occurs together with *N.scalaris* or non-variced individuals of the species, since both species are found separated in collections.

The subgenus remains monotypic and a further re-evaluation as to the merits of this genus-group is advisable.

Nassarius (Varicinassa) variciferus (A.Adams, 1852)
(Plate 35, figs.8,9)

1852. *Nassa varicifera* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108; 1853 Reeve, Conch.Icon. 8:pl.18,figs.118a,b.
1870. *Zeuxis varicifera* A.Adams, Ann.Mag.Nat.Hist. (4), 5:425; 1942 Yen, Proc.Malac.Soc.Lond. 24:232, pl.23,fig.165 (figd.syntype).
1879. *Nassa (Zeuxis) varicifera* (A.Adams), E.A.Smith, Proc.Zool.Soc.Lond. p.210;1882 Tryon, Man.Conch. 4:31,pl.10,fig.91; 1895 Pilsbry, Cat.mar.Moll.Japan p.36.
1934. *Nassarius variciferus* (A.Adams). Nomura & Zinbo, Venus:Jap.J.Malac. 4:305.
1934. *Nassarius (Zeuxis) variciferus* (A.Adams), Kawamoto, Venus:Jap.J.Malac. 4:307, textfig. 1(shell), textfig.2 (operculum).
1946. *Nassarius (Varicinassa) variciferus* (A.Adams), Habe, Venus:Jap.J.Malac. 14:193, textfig. 19 (radula).
1954 *Tritia (Varicinassa) varicifera* (A.Adams), Kira, Col.Illust.shells Japan 1:56, pl.28,fig.15.
1962. *Varicinassa varicifera* (A.Adams), Kira, Shells west.Pacific col. 1:80,pl.29,fig.14; 1967 Habe & Kosuge, Stand.book Jap.shells col. 3:76, pl.29, fig.34.
1974. *Nassarius (Varicinassa) varicifera* (A.Adams), Cernohorsky, Venus:Jap.J.Malac. 33(2):62, fig.19 (figd.syntypes).

Shell up to 30.0 mm in length, elongate-ovate, light in weight, spire produced, teleoconch of 5¾-6¼ convex whorls, protoconch of 3¼ glassy, smooth embryonic whorls, sutures narrowly ledged or weakly canaliculate; sculptured with very slender axial ribs which continue to the outer lip and number from 15-24 on the penultimate and from 15-25 on the body whorl; spiral sculpture consists of numerous, macroscopically pitted spiral groves which number from 11-13 on the penultimate and from 11-15 on the body whorl followed by an additional 7-9 nodulose cords and 7-8 oblique cords on the siphonal fasciole; a weak subsutural groove gives rise to an indistinct row of sutural nodules, nodules frequently doubled on body whorl, last three whorls with 1-2 broad, roundly angulate varices per whorl. Aperture shorter than the spire, moderately narrow, outer lip prominently variced, interior with 7-9 denticles, columellar callus weak above parietal wall but calloused and spreading on to fasciole anteriorly, and with 4-8 strong denticles and a parietal fold, siphonal notch and anal canal prominent. White, spire whorls ornamented with 2 often indistinct brown bands, body whorl with 2-3 bands, aperture white. Operculum brown and irregularly serrate on margin.

TYPE LOCALITY. Eastern Seas. Peitaho, north Chihli coast, China, is here designated as the type locality (specimens in USNM and ZMC).

DISTRIBUTION. From China to Korea and Japan. Subtidal to a depth of 188 m.

Type specimens. Three syntypes of *N. variciferus* (A.Adams), are in the British Museum (N.H.), London, No.1973151, and the specimen measuring length 29.0 mm, width 14.4 mm, is here selected as the lectotype (Pl.35, Fig.8).

Material examined. CHINA: Peitaho, N.Chihli coast (USNM; ZMC); Kiangsu, 32°36'N & 119°24'E (coll.Marrow); KOREA: S. of Korea, 34°30'N & 125°44'E, 37 m (BMNH); JAPAN: Kagoshima Gulf, to 188 m (USNM).

Subgenus **Profundinassa** Thiele, 1929

Profundinassa Thiele, 1929, Handb.syst.Weicht. 1:323. Type species by M *Nassa (Profundinassa) babylonica* Watson = *N.babylonica* Watson, 1882. Recent, Indo-Pacific.

Shell small, up to 14.0 mm in length, spire long and aperture short, whorls angulate at sutures, axially ribbed, sutures usually with prominent spiral cords or sub-echinate nodules which are frequently paired, parietal denticle obsolete or absent, siphonal canal short. Shell white or pale grey, with a thin periostracum.

Radula typically nassarine, laterals without intermediate accessory plates.

GEOGRAPHICAL DISTRIBUTION. Tropical and temperate Indo-Pacific and Eastern Pacific.

STRATIGRAPHICAL RANGE. Miocene to Recent. Reported from the European Miocene by Nordsieck. (1972).

The subgenus contains 3 recent and 2 fossil species from the Indo-Pacific region. *Nassarius townsendi* (Dall, 1890) from 1486 m off the Galapagos Is, also belongs to this group.

Nassarius (Profundinassa) babylonicus (Watson, 1882)
(Plate 36, figs.1-4)

1880. *Nassa babylonica* Watson, Marrat, Var.shells genus *Nassa* p.59 (nomen nudum).
1882. *Nassa babylonica* Watson, J.Linn.Soc.Lond. 16:366; 1903 Thiele, Wiss. Ergeb.deut.Tief.-Exped. "Valdivia" 7:167, pl.9,fig.53 (radula); 1925 Thiele, Wiss.Ergeb.deut.Tief.-Exped. "Valdivia" 17:183; 1959 Barnard, Ann.Sth.African Mus. 45:102,fig.22e (radula),fig.23e (protoconch);1973 Kensley, Sea shells South Africa p.160,fig.587.
1886. *Nassa (Aciculina) babylonica* Watson, Rept.Sci.Res,Voy.H.M.S."Challenger" 15:185, pl.11,fig.8 (protoconch and operculum); 1911 Schepman, Siboga-Exped. 49d:318.
1895. *Nassa turrifera* E.A.Smith, Ann.Mag.Nat.Hist. (6), 16:5, pl.1,fig.6; 1895 E.A.Smith, Ann.Mag.Nat.Hist. (6), 16:263.
1901. *Nassa (Alectryon) babylonica* Watson, Melvill & Standen, Proc.Zool.Soc.Lond. 2:409.
1903. *Nassa (Hebra?) babylonica* Watson, v.Martens, Wiss.Ergeb.Deut.Tief.Exped."Valdivia" 7:100, pl.3,figs.7,8.
1928. *Nassarius babylonicus* (Watson). Tomlin, Ann.Sth.Afric.Mus. 25(2):314.
1929. *Nassa (Profundinassa) babylonica* Watson, Thiele, Handb.syst.Weicht. 1;323, textfig.367.
1949. *Profundinassa babylonica* (Watson), Otuka, Jap.J.Geol.Geog. 21:303, pl.13, fig.5; 1960 MacNeil, Geol.Surv.Prof.Pap. No.339:78, pl.8,fig.26; 1961 Habe, Col.Illust.shells Japan 2:63, pl.32,fig.5; 1980 Noda, Sci. Repts.Inst.Geosc.Univ.Tsukuba, Sect.B, Geol.Sci. 1:23, pl.10,figs.19,30.

Shell up to 14.0 mm in length but frequently smaller, light in weight, turreted, teleoconch of 3½-5¾ weakly convex whorls which are prominently angulate at sutures, protoconch of 3¼-3½ glassy embryonic whorls, last two whorls finely carinate; sculptured with slender, angulate axial ribs which number from 12-17 on the penultimate and from 11-16 on the body whorl; spiral sculpture consists of 1-2 overriding subsutural cords which produce a single or double row of echinate nodules, interspaces with a few weak to obsolete spirals, last half to two-thirds of body whorl with 4-6 nodulose cords, siphonal fasciole with 3-4 oblique cords. Aperture short, narrow, outer lip narrowly variced, interior either smooth or with up to 9 weak denticles, columella very narrowly calloused, concave centrally, anterior half vertical or slightly recurved towards aperture and with 2-6 minute denticles, parietal denticle feeble, siphonal notch distinct, anal canal weak. Uniformly white to cream in colour under a pale straw-coloured periostracum.

TYPE LOCALITY. Philippines, 9°26'N &123°45'E, 686 m*(babylonicus);* St.162, off Coromandel Coast, 13°51'12"N & 80°28'12"E, 265-458 m *(turrifera).*

DISTRIBUTION. From the Gulf of Oman to East and S.E. Africa, India, Japan and East Australia. In fine sand, clay, or Globigerina and Pteropoda mud, subtidal to a depth of 1,786 m.

Type specimens. Three syntypes of *N.babylonicus* (Watson) are in the British Museum (N.H.), London, No.1887.2.9.636-8, and the specimen measuring length 10.3 mm, width 5.6 mm, is here selected as the lectotype (Pl.36, fig.1). The type specimen of *Nassa turrifera* E.A.Smith, has not been located at the British Museum (N.H.), London.

Material examined. EAST AFRICA: off Beira, Mozambique, 20°08'S & 35°33'E, 100 m and 20°12'S & 35°15'E at 390 m (both ZMC); *c.* 80 km Sth. of Ponta da Barre, Mozambique, 880 m (USNM); INDIA: St.162, Indian

Seas, 458 m (ZSI); Bay of Bengal, 275 m (USNM); INDONESIA: N.W. of March I, Molucca Passage, 796m; off Olang Pt., Gulf of Boni, Celebes, 886 m at 5° C; off Makayan I, Molucca Pass, 503m; off Sipadan I, Sibuko Bay, 759 m at 5.7°C; off Lamulu Pt., Gulf of Boni, Celebes, 988 m at 4.5°C (all USNM); S.E. of Dodepo I, Gulf of Tomini, Celebes (ZMC); PHILIPPINES: off Apo I, Sth.Negros, 456 m at 12°C; off Cape Santiago, Luzon, 512 m at 8°C; off Malagrigo. E.Mindoro, 518 m; off Cagayan I, Jolo Sea, 622 m at 10°C; W.of Baracay I. Panay, 571 m; Iligan Bay, N.Mindanao, 814-924 m at 11.5°C; off N.W. Panay I, 571 m at 9.6°C; of Dinakta Pt., Panaon I, 1786 m at 11°C; Sogod Bay, Leyte, 919 m; off Sombrero I, Balayan Bay, 432m, off Lianga, Mindanao, 750 m at 11.7°C; off Balicasag I, Sth.Bohol, 807 at 11.7°C; off Malavatuan I, W.Luzon, 512 m at 8°C (all USNM); CHINA: off Pratas I, China Seas, 381 m at 10°C; JAPAN: Okinoshima, Kochi Prefecture; Enshu-nada, off Central Honshu, *c.* 150-200 m (both NSMT); AUSTRALIA: Queensland: 3 km N.E. of Gillet Cay, Swains reef, 64-73 m; Capricorn group, *ex-pisces* (both AMS); New South Wales; off Ulladulla, 35°30'S & 150°48'E, 549 m (AMS).

Fossil record. MIO/PLIOCENE: Okinawa, Ryukyu Is (MacNeil 1960).

The type-figure of *Nassa turrifera* E.A.Smith, clearly represents *Nassarius babylonicus*. E.A.Smith (1895a) himself pointed out that he overlooked the description of *babylonicus* Watson and that his *Nassa turrifera* is identical. It is probable that the specimen from Station 162, Indian Seas, 458 m, in the collection of the Zoological Survey of India, Calcutta, is the type species of *Nassa turrifera* E.A.Smith.

Nassarius (Profundinassa) omuensis (Noda, 1980)
(Plate 36, Fig.5)

1980. *Profundinassa omuensis* Noda, Sci.Repts.Inst.Geosci.Univ.Tsukuba, Sect.B, Geol.Sci. 1:23, pl.10,figs.1,24.

"Shell small to moderate in size and fusiform. Protoconch small, multispiral in 3⅓ volutions with oblique reticulation. Teleoconch 5 in number. Post-nucleous whorls rather slender. Subsutural area gentle in slope and surrounded by angulate shoulder. External surface sculptured with slightly oblique axial narrow ribs, 20 in number at penultimate whorl which die out at body whorl. Interspaces of axial ribs rather smooth but with indistinct, low, wide, flat topped threads separated by linear furrows continued to body whorl but not crossed over axial ribs. Aperture ovately rounded. Outer lip thin and smooth. Parietal callus narrow and thin. Columella short. Siphonal canal wide and turned posteriorly." (Original description).

TYPE LOCALITY. Locality 435, N.W. of Shikenbaru, Tamagusukumura, Shimajiri-gun, Shinzato formation, Okinawa, Ryukyu Is.

DISTRIBUTION. Pliocene of Ryukyu Is.

Type specimens. The holotype of *N.omuensis* (Noda) is in the Institute of Geology, Tsukuba University, No.IGUT-10183, length 9.2 mm, width 4.8 mm.

The description of *N.omuensis* has been based on a solitary juvenile specimen.

Nassarius (Profundinassa) dilutus (E.A.Smith, 1899)
(Plate 36, figs. 6-9)

1899. *Nassa (Hebra) diluta* E.A.Smith, Ann.Mag.Nat.Hist. (7), 4:243.
1901. *Nassa diluta* E.A.Smith in Annandale & Stewart, Illust.Zool."Investigator", Moll. Pt.6:pl.11, figs.3,3a.
1968. *Profundinassa pupa* Okutani, Bull.Tokai Reg.Fish.Res.Lab.Tokyo No.56:34, pl.3,fig.8 (shell), textfig.4 (operculum and radula).
1982. *Nassarius dilutus* (E.A.Smith), Cernohorsky, Bull.Mus.nat.Hist.Nat. Paris (4), 3(4):989, pl.1,fig.1.

Shell up to 13.0 mm in length, ovate-pupiform, light in weight, teleoconch of 4-5¼ concavo-convex whorls, protoconch of 3-3½ embryonic whorls which usually have a fine sutural thread, last whorl with a fugitive carina and in well-preserved specimens fine axial striae; protoconch often decorticated and thus appearing to have only *c.* 2 whorls. Sculptured with a slender, angulate axial ribs which may become obsolete or weak on the dorsal side of body whorl; axial ribs prominently constricted anteriorly to sutures and forming echinate to sub-echinate nodules. Spiral sculpture weak and often obsolete with the exception of 4-6 coarse spiral threads at base of body whorl and 2-3 cords on siphonal fasciole. Aperture small, outer lip thin and not variced, interior edentulous, columella narowly calloused and smooth apart from a simple, well defined fold at base, parietal denticle absent, siphonal notch and anal canal poorly developed. Uniformly white to fawn in colour. Operculum dark brown, irregularly trigonal, margins simple.

TYPE LOCALITY. Off Colombo, Ceylon [= Sri Lanka], 1,093 m; off Kistna coast, 1,378 m *(dilutus);* off Miyake I, Japan, 34°22'N & 139°41.9'E, 1,080-1,205 m *(pupa)*. The type locality is restricted to off Colombo, Sri Lanka, 1,093 m.

DISTRIBUTION. From East Africa to India, Japan and the Arafura Sea, Northern Australia. In grey and bluish-green mud, subtidal to a depth of 1,788 m.

Type specimens. The type specimens of *N.dilutus* (E.A.Smith), have not been located, but the original illustration from Annandale & Stewart (1901) clearly identifies the species. The immature holotype of *Profundinassa pupa* Okutani, is in the Tokai Research Laboratory collection, length 10.0 mm, width 6.3 mm.

Material examined. EAST AFRICA: W. Bank of Leven, Mozambique Channel, 12°35'S & 47°38'E, 1,100 - 1,150 m (MNHNP); INDONESIA: S.E. of Dodepo I, Gulf of Tomini, Celebes, 1,241 m; off Lamulu Pt., Gulf of Boni, Celebes, 988 m at 4.5°C (both USNM); PHILIPPINES: 13°54'N &119°57'E, 970 m; 13°49'N 120°00'E, 925 m (both MNHNP); NORTHERN AUSTRALIA: Arafura Sea, 5°46.7'E & 134°00'E, 1,788 m (ZMA).

Nassarius (Profundinassa?) infralaevis (Fischer in Wanner, 1927)
(Plate 36, figs.11,12)

1927. *Nassa (Hinia) infralaevis* Fischer in Wanner, Palaeont.v.Timor Lief.15.(25):74, pl.213,figs.47a,b.

"Shell small, ovate, with a total of 6½ whorls, and if indeed belonging to an adult animal, with a proportionately large protoconch of 4 whorls; the embryonic whorls are convex and have a sharp spiral keel. Whorls separated by a wavy suture; sculptured with strong axial ribs, 11 per whorl; whorls with 3 spiral cords on the presutural ramp, interspaces of ribs smooth or with 3-4 obsolete spirals in centre of body whorl. Base of body whorl sculptured with stronger spiral cords, aperture ovate, slightly angulate without an anal canal, outer lip with a broad, flat, spirally striate varix, interior with 8 equal-sized lirate denticles. Columella narrowly calloused, and with very small denticles and a basal fold, parietal denticle distinct. This is not a juvenile example of *Nassa babylonica* Watson, which has a different protoconch, more prominently angulate whorls and narrower axial ribs." (Abridged original description).

TYPE LOCALITY. Akelamo valley, Obi I, Timor, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The location of the type speciment of *N.infralaevis* (Fischer in Wanner) is not known to me. The original dimensions were length 5.0 mm.

Nassarius (Profundinassa?) patricius (Thiele,1925)
(Plate 36, fig.10)

1925. *Nassa patricia* Thiele, Wiss.Ergeb.deut.Tief.Exped."Valdivia" 17:331, pl.20,fig.17.

"A small shell resembling *N.delicatus* (A.Adams), but considerably smaller, with smooth ribs, a small fold anterior to sutures and 2 brown bands on the body whorl. This species also resembles the original illustration of *N.babylonicus* and certainly belongs in the same group. The shell is transparent-white, anterior to the centre of the body whorl with a brown band which is frequently interrupted on the dorsal side. Coniform, with a total of 7 whorls of which 4 are smooth embryonic whorls with the last one weakly carinate; mature whorls have straight, angulate axial ribs and anterior to the suture an overriding spiral cord, interspaces smooth, base with 4 spiral cords. Siphonal fasciole recurved and with weak cords, columella callus weakly produced, thin above but laminate anteriorly, columella weakly wrinkled. Aperture rather small, interior with weak lirae, outer lip variced." (Free translation).

TYPE LOCALITY. Padang, Sumatra, Indonesia.

DISTRIBUTION. Unknown.

Type specimens. The holotype of *N.patricius* (Thiele), is in the Zoological Museum, Humboldt University, Berlin, length 3.7 mm, width 2.4 mm.

I have not seen any other examples of this species.

Subgenus **Hima** Leach in Gray, 1852

Hima Leach in Gray, 1852, Moll.Brittan,Synop. p.123. Type species by SD (Marwick, 1931) *Buccinum minutum* Pennant, 1777 = *B.incrassatum* Strom, 1768. Recent, Mediterranean.

1852. *Tritonella* A.Adams, Proc.Zool.Soc.Lond.Pt.19:111 (non Swainson, 1839).

1931. *Mirua* Marwick, N.Z.Geol.Surv.Palaeont.Bull. No.13:115. Type species by OD *Nassa socialis* Hutton, 1886 = *Nassarius tatei socialis* (Hutton, 1886). Miocene of New Zealand.

1936. *Reticunassa* Iredale, Rec.Austral.Mus. 19:322. Type species by OD *Nassa paupera* Gould, 1850. Recent, Indo-Pacific.

Shell small, up to 20.0 mm in length, elongate-ovate or ovate, sutures distinct, whorls prominently convex, sculptured with axial ribs and prominent overriding spiral striae; aperture short and roundly ovate, columella calloused, plicate, wrinkled or irregularly denticulate, outer lip denticulate and backed by a varix, siphonal canal short.

Laterals of radula with 2 simple cusps, accessory lateral plate present.

GEOGRAPHICAL DISTRIBUTION. Cosmopolitan.

STRATIGRAPHICAL RANGE. Miocene to Recent.

The subgenus contains 12 recent and 8 fossil species from the tropical Indo-Pacific. The group has been very successful during the Miocene when *Hima* was widely distributed in Europe and was also known from the Upper Miocene of the Austral-Neozelanic region.

Confusion surrounds the usage of *Tritonella* A.Adams and *Hima* Leach in Gray. Anderson (1964) cites *Tritonella* A.Adams in H. & A.Adams,1853, as a subgenus of *Hinia* Leach in Gray, 1847, and the same arrangement is adopted by Nordsieck (1968). Shuto (1969) uses *Tritonella* A.Adams in H. & A.Adams, as a subgenus of *Tritia* Risso, 1826, and considers the type to be *Buccinum incrassatum* Ström by original designation. The genus *Tritonella* has been erected by A.Adams already in 1852, with 12 included species and no designated type; the species *B.incrassatum* was included by A.Adams (op.cit.) in the synonymy of *Nassa (Tritonella) ascanias* Bruguiere, 1789. A year later H. & A.Adams placed *Tritonella* in the synonymy of *Hima* Leach in Gray, 1852, without designating a type. *Tritonella* A.Adams, 1852, is not available as it is a primary homonym of *Tritonella* Swainson, 1839, in Amphibia.

The genus *Hima* was established with 3 included species, i.e. *H.minuta* (Pennant), *H.reticulata* (Linnaeus) and *H.laevigata* Leach in Gray. Since the species *Buccinum incrassatum* Ström was not cited by name, Cossmann's (1901) and Dall's (1908) designation of this species as the type of *Hima* are invalid. Woodring's (1928) designation does not appear to be valid either, as the sentence "if *Hima minuta* (Pennant) is taken as the type of *Hima*" is a designation made in an ambiguous and qualified manner (art.67(c) of ICZN). The next valid type designation of *Hima* is the one by Marwick (1931).

Nassarius (Hima) pauperus (Gould, 1850)
(Plate 37, figs.1-14)

1850. *Nassa paupera* Gould, Proc.Boston.Soc.Nat.Hist. 3:155; 1852 Gould, U.S.Expl.Exped. 12:262, pl.19,figs.330,a,b; 1889 Brazier, J.Conch. 6:66; 1901 Tate & May, Proc.Linn.Soc.N.S.W. Pt.3:359; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:124.
1860. *Nassa microstoma* Pease, Proc.Zool.Soc.Lond. p.145; 1865 Carpenter, Proc.Zool.Soc.Lond. p.516; 1965 Kay, Bull.Brit.Mus.(Nat.Hist.),Zool.Suppl. 1:24, pl.3,figs.5,6.(figd.holotype).
1860. *Nassa dermestina* Gould, Proc.Boston Soc.Nat.Hist. 7:331; 1895 Pilsbry, Cat.mar.Moll.Japan p.36; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:67,pl.16,fig.1.
1860. *Nassa plebecula* Gould, Proc.Boston Soc.Nat.Hist. 7:332; 1959 Barnard, Ann.Sth.Afric.Mus. 45:118; 1964 Johnson, U.S. Nat.Mus.Bull. No.239:128, pl.16,fig.6.
1864. *Nassa tringa* Souverbie in Souverbie & Montrouzier, J.Conchyl. 12:272, pl.10,fig.7; 1933 Dautzenberg & Bouge, J.Conchyl. 77:216.
1865. *Nassa compacta* Angas, Proc.Zool.Soc.Lond. p.154.
1869. *Nassa balteata* Pease, Americ.J.Conch. 5:71, pl.8,fig.5 (publ.7 October 1869) [non *N.balteata* Lischke - publ.May 1869].
1869. *Nassa costulata* var. *erythraea* Issel, Malac.Mar.Rosso p.126 (ref.to Savigny, Desc.de l'Egypte, Atlas, 2:pl.6,fig.4); 1982 Bouchet & Danrigal, Nautilus 96(1):13, fig.44 (figd.syntype).
1877 *Nassa (Hima) mirostoma (sic)* (Pease), Brazier, Proc.Linn.Soc.N.S.W. 1:181.
1877 *Nassa (Hima) dermestina* (Gould), Brazier, *ibid.*, 1:181; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:413.
1877. *Nassa (Hima) unifasciata* var. Pease, Brazier, *ibid.*, 1:181.
1879. *Nassa (Hima) luteola* E.A.Smith, Proc.Zool.Soc.Lond. p.212, pl.20,fig.47; 1882 Dunker, Index Moll.Mar.Japonici p.37; 1895 Pilsbry, Cat.mar.Moll.Japan p.36.
1886. *Nassa (Hima) paupera* (Gould), Watson Rept.Sci.Res.Voy.H.M.S."Challenger," Zool. 15:186; 1911 Schepman, Siboga-Exped. 49d:324; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:414; 1904 Sturany, Denk.k.Akad.Wiss.Math-nat.Wien 74:243; 1932 Dautzenberg, J.Conchyl. 76:33; 1955 Marche-Marchad,J.Conchyl. 95:32.
1895. *Nassa (Hima) plebecula* (Gould), Pilsbry, Cat.mar.Moll.Japan p. 36; 1895 Melvill & Standen, J.Conch. 8:107.
1897. *Nassa producta* Sowerby, Append.mar.shells Sth.Africa p.6, pl.8,figs.4,5 (non Bellardi, 1882).
1907. *Nassa mamillata* Preston, J.Conchyl. 54:267, textfig.1. (non *Planaxis mamillata* Risso, 1826 = *Nassarius*).
1915. *Arcularia pilata* Hedley, Proc.Linn.Soc.N.S.W. 39:739, pl.84,fig.80.
1918. *Nassarius pauperus* (Gould), Hedley, J.Proc.R.Soc.N.S.W. 1:M88; 1923 May, Illust.Index Tasman shells p.81, pl.38,fig.14; 1932 Cotton & Godfrey, Sth.Austral.Nat. 13:96, pl.1,fig.3.
1926. *Nassa erythraea* (Issel), Pallary, Mem.Inst.d'Egypte p.88, pl.6,fig.4.
1928. *Nassarius (Hima) pauper* (Gould), Melvill, Proc.Malac.Soc.Lond. 18:107; 1930 Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova. 55:62.
1928. *Nassa gregaria* Grabau & King, Peking Soc.Nat.Hist.Handb. No.2:207,pl.8, fig.71.

1929. *Nassarius plebeculus* (Gould), Tomlin, Ann.Sth.Afric.Mus. 25:324.
1929. *Nassa (Hima) balteata* (Pease), Dautzenberg, Faune Colon.Franc. 3:412.
1929. *Nassa (Hima) erythraea* (Issel), Dautzenberg, *ibid.*, 3:413.
1953. *Nassarius (Hima) tringa* "Sowerby", King, Trans.Geol.Soc.Sth.Africa 56:79.
1954. *Tritia (Reticunassa) dermestina* (Gould), Kira, Col.illust.shells Japan 1:56, pl.28,fig.11.
1955. *Reticunassa paupera* (Gould), Cotton, R.Soc.Sth.Austral.Malac.Sect. No.7:2, fig.11; 1962 Macpherson & Gabriel, Mar.Moll.Victoria No.2:195; 1966 Hodgkin et al., West.Austral.Mus.Club Handb. No.9:43.
1960. *Nassarius (Reticunassa) taggartorum* Kuroda, Cat.Moll.fauna Okinawa p.75, pl.3,fig.46.
1960. *Reticunassa dermestina* (Gould), Azuma, Cat.Moll.Shikoku Japan p.42 1962 Kira, Shells west.Pacific col. 1:80, pl.29,fig.11; 1967 Habe & Kosuge, Stand.book Jap.shells col. p.75, pl.29,fig.29; 1971 Kuroda & Habe, Sea shells Sagami Bay p.175,pl.47,fig.10.
1962. *Reticunassa tringa* (Souverbie), Iredale & McMichael, Austral.Mus.Mem. No.11:67; 1969 Garrard. J.Malac.Soc.Australia No.12:67.
1962. *Reticunassa compacta* (Angas), Macpherson & Gabriel, Mar.Moll.Victoria Handb. No.2:195.
1972. *Nassarius (Hima) pauperus* (Gould), Cernohorsky, Rec.Auckland Inst.Mus. 9:186, figs.151-154; 1974 Cernohorsky, Venus:Jap.J.Malac. 33:51, figs.7-12 (figd. syntypes); 1977 Salisbury, Hawaiian Shell News 25(2):5, fig.5.
1972. *Hinia erythraea* (Issel), Barash & Danin, Israel J.Zool. 21:356.

Shell up to 16.0 mm in length but frequently smaller, slender elongate to broadly ovate, teleoconch of 4¼-7 convex whorls, protoconch of 2-2¾ embryonic whorls, second embryonic whorl slightly bulbous and either moderately high or low, smooth in appearance but macroscopically axially striate and microscopically minutely pitted, 1-3 spiral cords intrude for a short distance onto last embryonic whorl after axial sculpture has ceased, sutures tight, not canaliculate; sculptured with close-set, rounded axial ribs which sometimes become weaker on the dorsal side of body whorl, ribs encircled by discreet or prominent spiral threads which are usually more defined on the summits of axial ribs, siphonal fasciole with oblique cords; interspaces of spiral threads with close-set macroscopic spiral or axial striae. Aperture narrow, shorter than the spire, roundly ovate, outer lip thick and strongly varied in adults, interior with strong denticles, columella with a distinctly bordered collumellar callus and distinct lirae in adult specimens, siphonal notch deep, anal canal distinct. Variable in colour, either uniformly cream to brown in colour, some individuals with 1-2 brown bands on body whorl and 1-2 white or brown blotches on the back of the outer lip, some individuals reddish-brown with a golden cast. Operculum brown and finely serrate at margins.

TYPE LOCALITY. Pacific Ocean *(pauperus)*; Hawaiian Is *(microstoma);* Kikaigashima, Ryukyu Is *(dermestina)*; Amami-O-Shima, Ryukyu Is *(plebecula)*; New Caledonia *(tringa)*; St.Vincent's Gulf, South Australia *(compacta)*; Ebon I, Marshall Is *(balteata* Pease); Suez, Red Sea *(erythraea)*; Goto I, Japan *(luteola)*; Durban, South Africa (*producta* Sowerby); New Caledonia (*mamillata* Preston); Torres Strait, 22m and Darnley I, 55 m, Australia *(pilata)*; Peitaho, China *(gregaria)*; Okinawa Is, Ryukyu Is *(taggartorum)*.

DISTRIBUTION. From the Red Sea and Pakistan to South Africa, Japan, Australia, and the Cook and Hawaiian Is. In clean coral and muddy sand, from the intertidal zone to a depth of 146 m.

Dautzenberg & Bouge's (1933) record of the species from the Tuamotu Archipelago requires confirmation since no specimens have been seen east of the Cook Is.

Type specimens. The following type specimens are in the National Museum of Natural History, Washington: the immature holotype of *N.pauperus* (Gould), No.USNM-5726, length 9.1 mm, width 4.8 mm; the holotype of *Nassa dermestina* Gould, No.USNM-24166, length 7.0 mm, width 3.4 mm; the lectotype of *N.plebecula* Gould, No.USNM-24168, length 10.3 mm, width 4.8 mm. The following type specimens are in the British Museum (N.H.), London: the immature holotype of *N.microstoma* Pease, No.1961458, length 9.0 mm, width 4.0 mm; four syntypes of *N.compacta* Angas, No.1870.10.26.85; the immature holotype of *N.luteola* E.A.Smith, No.1878.11.7.39., length 7.4 mm, width 4.2 mm,the holotype of *N.producta* Sowerby, No.1899.4.14.3604, length 13.7 mm, width 5.7 mm; and the holotype of *N.mamillata* Preston, No.1923.2.20.8, length 9.0 mm, width 5.4 mm. A syntype of *N.erythraea* Issel, is in the Museum National d'Histoire Naturelle, Paris, length 8.0 mm, width 4.2 mm. Syntypes of *N.tringa* Souverbie, are in the Museum of Bordeaux and in the Museum National d'Histoire Naturelle, Paris, dimensions of illustrated syntype length 9.6 mm, width 4.8 mm (pl.37, figs.5,6). Three syntypes of *Arcularia pilata* Hedley, are in the Australian Museum, Sydney, No.C-8071, and the specimen measuring length 6.0 mm, width 3.6 mm, is here selected as the lectotype (pl.37, fig.3). The type specimens of *Nassa balteata* Pease, could not be found, and the location of the types of *N.gregaria* Grabau & King, and *Nassarius taggartorum* Kuroda, is not known to me.

Material examined. RED SEA: Eilat, Gulf of Aqaba; Ras A Tantur; Hawakil Bay, Eritrea, 18-24m; Dahlak Archipelago 110m; Marsa El Et, Gulf of Aqaba; Taba, Gulf of Aqaba; off Nuweiba, 137-146 m (all TAU); PAKISTAN: Karachi (AMS); EAST AFRICA: Fumba, S.W. Zanzibar (coll.Powell); off Beira, Mozambique, 20°12'S & 35°15'E; Porto Amelia, Mozambique, 12°58'S & 40°36'E (both ZMC); Nossi-Be, Zanzibar (coll.Harakh); SEYCHELLES IS: off Mahe I, 7 m (coll.Dale); MADAGASCAR: (SMOM); ANDAMAN IS: (ZSI); THAILAND: Rayong Bay, 13-18 m; Koh Kahdat, 2 m (both ZMC); MALAYSIA: Singapore, 4-5 m (ZMC); INDONESIA: Amboina Bay, *c.* 94 m ; off Doelah, Kai Is, 50 m (both ZMC); Mali, Alor I, N. of Timor; Sanur Beach, Bali (both coll.McCausland); PHILIPPINES: Pangangon, Bohol (coll.Steiner); W. of Tara I; off S.E. Tawi Tawi, 33 m; off Jolo, 42 m (all USNM); Matabungkai, 115 km S.W. of Manila (AMS); Punta Engano, Mactan I, Cebu (coll.Dan); VIETNAM: Saigon (USNM); CHINA: Peitaho (ZMC); Hong Kong (AMS; USNM); TAIWAN: (coll.Allo); JAPAN: Hirado, Hizen (AMS); CAROLINE IS: S. end of Yap I (coll.McCausland); MARIANAS IS; Apra Harbour, Guam I (coll.McCausland); Anae I, Guam I (coll.Richardson); Piti Pt., Guam I (coll.Deynzer); MARSHALL IS: Rigili I, Enewetak Atoll; Bikini I; Enybarbar I, Rongelap Atoll (all USNM); Enewetak lagoon, 5 m (coll.Johnson); WEST IRIAN: Middleburgh (AMS); PAPUA NEW GUINEA: Madang (USNM); Milne Bay; S.W. of Losula, Kiriwina I and Kuia I, Trobriand group; Kapa Kapa, S.E. of Port Moresby; Megiar harbour, N. of Madang (all AMS); Nonga, E.New Britain (coll.Parkinson); AUSTRALIA: Western Australia: Broome; S.of Cowaramup; Yardie Creek, Exmouth; Esperance; Onslow jetty; S. of Woodman Pt., Cockburn Sound; Bandicoot Bay, Barrow I, 20°52'S & 115°19'E; Monte Bello I (all AMS); Northern Territory: 36 km off Point Charles, Darwin (AMS); Queensland: Caloundra; Lady Elliot I; Darnley I, Torres Str.; Little Upolu Cay, N.E. of Cairns; Keeper reef, N.E. of Townsville; Dunk I; Murray I, Torres Str.; Palm I; Masthead I, 31-37m; Facing I; Sweers I; Port Curtis, 13-18 m; Hope I; (all AMS); Moreton Bay; Jumpin Pin Bar; Shaw I, 18 m; Hope I, 9-18 m (all AIM); New South Wales: Twofold Bay; Hawkesbury River; off Eden, 73-91 m; Bradley's Head; Woolgoolga (all AMS); Cronulla; Long reef, Sydney; Kurnell, Botany Bay (all coll.Powell); Watson's Bay, Port Jackson, 5-9 m; off Eden, 37°05'S & 150°05'E, 53-98 m; Sydney Harbour; Disaster Bay, 55-73 m (all ZMC); Balmoral, Sydney (AIM); Port Hacking, Sydney (coll.Willan); Victoria: Port Fairy; Western Port; Mallacoota; 46 km off Cape Everard, 132-146 m (all AMS); South Australia: Yorke's Peninsula, N.of Stansbury (AIM); Port Willunga (coll.Powell); Port Pirie, Spencer Gulf (USNM); N. of Cape Borda; Hardwick Bay; Port Augusta; Glenelg Beach near Adelaide (all AMS); Tasmania: Tamar Heads; Boat Harbour; Somerset (all AMS); Bung's Beach, Barren I; Thunder & Lightning Bay, Barren I; Blyth; Cook's Beach (all TMAG); LORD HOWE I; North Bay (AMS); NORFOLK I: (USNM); Slaughter Bay and Emily Bay (both NZGS); NEW CALEDONIA: Oubatche; Noumea (both AMS); Prony Bay (coll.Reverce); LOYALTY IS: Lifu I (AMS); Ouvea I (coll.Cole); NEW HEBRIDES: Pango Pt., Efate I (coll. Eker); Mele Beach, Efate I (coll.Cole); FIJI IS: Manava I, N.off Viti Levu (coll.Eker); Nukubuco Passage, S.Viti Levu (coll.Walton); Lami, Suva, Sth.Viti Levu; Mamanuca group (both coll.Marrow); Suva Harbour, 18°08'S & 178°25'E (MC); Nadi Bay (AMS); Lakeba I, Lau group (AIM); SAMOA: Pilot Flagstaff; Apia Harbour; Luatuanu'u, Upolu (all coll.Powell); Sogi, Apia (coll.Scott); TONGA IS: Va'vau I (coll.Northgrove); COOK IS: Avarua Beach, Rarotonga (AMS); LINE IS: Malden I (coll.Marrow); HAWAIIAN IS: Honolulu, 19-75 m (ZMC); Keehi lagoon, Oahu, 76 m (coll.Bratcher); Kauai (coll.Powell); off Waikiki, 60-92 m (USNM); Honolulu Bay, Maui (LACM); off Koloa landing, Kauai I, 18 m (coll.Haas); Pupukea Beach, Oahu (coll.Salisbury).

Fossil record. PLIOCENE: Mandul I, Borneo, Indonesia (Beets 1950).

The species is variable in shape and slightly less so in sculpture, and as a result has received 14 names. The slender, elongate form of the species has been described as *plebecula, microstoma, producta* and *gregaria*; the squat broad form as *tringa, erythraea, compacta* and *mamillata,* and adult and immature individuals of a form intermediate between the two have received the names *pauperus, dermestina, balteata, pilata, luteola* and *taggartorum.*

In a population of *pauperus* from Norfolk Island, *c.*300 specimens collected in a restricted area of Emily Bay, displayed the whole variational range of shape, sculpture and colour.

The type specimens of six of the described taxa of *N.pauperus* have already been illustrated by Cernohorsky (1974b).

Nassarius (Hima) rotundus (Melvill and Standen, 1896)
(Plate 37, figs. 15-17)

1896. *Nassa (Niotha) rotunda* Melvill & Standen, J.Conch.8:273, pl.9,fig.2; 1899 Melvill & Standen, J.Linn.Soc.Lond.,Zool. 27:160.

1972. *Nassarius (Hima) rotundus* (Melvill & Standen), Cernohorsky, Rec.Auckland Inst.Mus. 9:187, fig.155.

Closely similar to *N.pauperus* (Gould) in protoconch and some other features, but smaller, only 6.0-7.0 mm in length and shorter in form and even more rotund than the broad, ovate forms of *N.pauperus.* Sculpture in *N.rotundus* coarser and more granulose, with closer set axial ribs and thicker, overriding spiral cords which produce laterally elongated nodules upon the summits; penultimate whorl with 4-5 spiral rows of nodules, body whorl with 9-10 rows. Aperture small, more rotund, outer lip thickened and variced, interior with 5-6 denticles, third denticle anterior to the anal canal and last

anterior denticle the largest, columella calloused, bordered, laminate and wrinkled along its entire length, siphonal notch prominent, anal canal distinct. Cream in colour, body whorl with 3 very faint orange-brown bands, bands usually visible as 2-3 brown blotches on the back of the outer lip.

TYPE LOCALITY. Lifu, Loyalty Is.

DISTRIBUTION. Known only from the Loyalty Is. Also reported from Warrior I, Torres Strait, Australia, by Melvill & Standen (1899).

Type specimens. The holotype of *N.rotundus* (Melvill & Standen), is in the Museum of the University of Manchester, length 5.6 mm, width 3.3 mm.

Material examined. LOYALTY IS: Lifu I (coll.Powell).

This species appears to be rare. Further research into the relationship between *N.pauperus* (Gould), and *N.rotundus* is clearly indicated.

Nassarius (Hima) crenulicostatus (Shuto, 1969)
(Plate 38, figs.1,2)

1969. *Tritia (Tritonella) crenulicostata* Shuto, Mem.Fac.Sci.Kyushu Univ., (D), Geol. 19(1):148, pl.17,figs.7-9, textfig.28.

Shell up to 7.0 mm in length, similar to the short broad form of *N.pauperus* (Gould), teleoconch of 3¾ - 4¼ convex whorls, whorls constricted just posteriorly to sutures, protoconch conical and of 3¼-3½ glassy whorls; sculptured with rounded axial ribs which continue to the back of the outer lip and number from 14-17 on the penultimate and *c.*14 ribs on the body whorl; spiral sculpture consists of encircling spiral cords which produce narrow nodules upon the summits, spirals numbering from 6-7 on the penultimate and 12 on the body whorl, siphonal fasciole with 4-5 oblique cords. Aperture small, roundly ovate, outer lip thick and strongly variced, interior with 6 denticles, third anterior and last anterior denticle sometimes larger than the rest, columella narrowly calloused and wrinkled, siphonal notch and anal canal distinct. Cream to golden straw-yellow in colour, body whorl with 2-3 faint orange-brown bands, bands usually visible as 2-3 brown blotches on the back of the outer lip.

TYPE LOCALITY. Ilo Ilo, Panay I, Upper part of the Dingle formation, Neogene of the Philippines.

DISTRIBUTION. Known only from the Philippines.

Type specimens. The holotype of *N.crenulicostatus* (Shuto), is in the Geology Department, Kyushu University, No.GK-L 6987, length 5.7 mm, width 3.3 mm.

Material examined. PHILIPPINES: Punta Engano, Mactan I, Cebu, 200 M (coll.Marrow); off Bantayan I, 55 m (coll. Norton).

N.crenulicostatus can only be separated from *N.pauperus* on features of a more conical protoconch of 3¼-3½ whorls (2-2¾ in *pauperus*), and without a complete protoconch cannot be assigned to either one or the other species. A similar problematical difference in protoconch characters has been observed in the Caribbean *N.albus* (Say) and the buccinid species *Nassaria acuminata* (Reeve) [range 1¾ - 3 embryonic whorls]. It is probable that the actual range in the number of embryonic whorls within a species of Nassariidae may be larger than is taxonomically admissable at the moment (¾ turns). To complicate matters further, 2 specimens of otherwise typical *N.pauperus* from the Lau group of the Fiji Islands have been examined, and these had a protoconch of only 1½ embryonic whorls.

Specimens of *N.pauperus* with only 2¼ embryonic whorls occur together with *N.crenulicostatus* at Punta Engano, Mactan I, Philippines.

Nassarius (Hima) mangkalihatensis Beets, 1941
(Fig. 148a)

1941. *Nassarius (Uzita) mangkalihatensis* Beets, Verh.Geol.Genoot.Ned. & Kolon.,sre.Geol., 13:101, pl.9, figs.357-359.

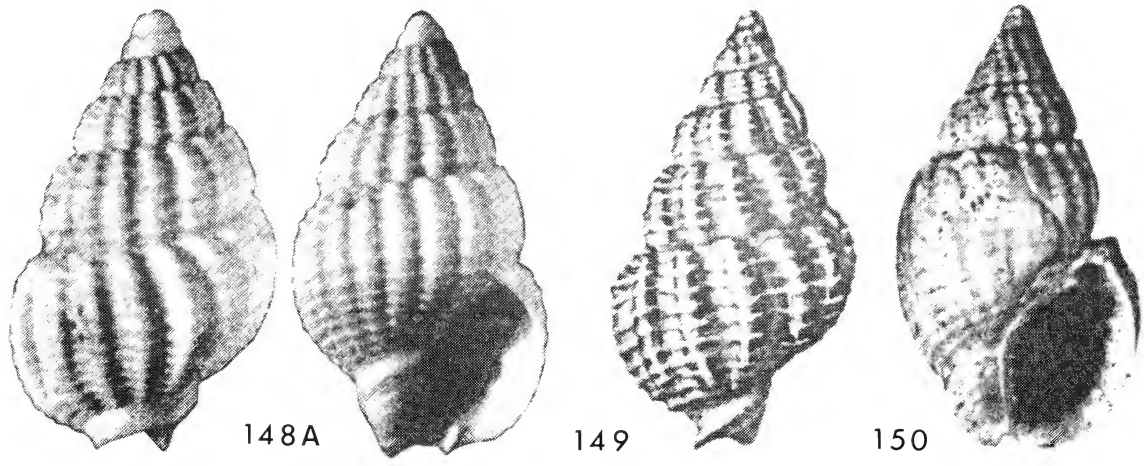
"Shell elongate-ovate, with 7 convex whorls which are distinctly separated from each other by a slightly deep, wave-like suture. The elevated protoconch (nucleus depressed) numbers 2 to 2+ smooth embryonic whorls which have nebulous axial striae on the last turn of protoconch. Sculptured with axial ribs which number 14-18 per whorl and are continuous from suture to suture; ribs are rounded and about as wide as interspaces; spiral sculpture consists of spiral threads which number 5-6, the sixth being posterior to suture, spirals becoming nodose upon axial ribs, interspaces smooth, except for very fine striae, axial ribs become more slender on body whorl. Aperture ovate and slightly oblique, outer lip with a strong, broad varix, interior with up to 5 denticles, first denticle bordering canal and the second from the back most developed. Columella with a thin, well-bordered callus which is sculptured with small wrinkles." (Abridged translation).

TYPE LOCALITY. Mangkalihat, East Borneo, Upper Miocene of Indonesia.

DISTRIBUTION. Miocene of Indonesia.

Type specimens. The location of the 4 syntypes of *N.mangkalihatensis* Beets, is not known to me. The original dimensions were length 5.4 mm.

The illustrated holotype is not fully mature and closely resembles the species *N.pauperus* (Gould).



Figs. 148a-150. Fossil Nassariinae. 148a. *Nassarius (Hima) mangkalihatensis* Beets. Type-figure; 5.4 mm. Immature specimen (from Beets, 1941, pl.9,figs.357,359). 149. *N. (H.) varicosecostatus* (Fischer in Wanner). Type-figure; 10.0 mm (from Fischer in Wanner, 1927, pl.213, fig.49). 150. *N. (H.) vandervlerki* Oostingh. Type-figure; 9.7 mm (from Oostingh, 1939, pl.16,fig.279).

Nassarius (Hima) varicosecostatus (Fischer in Wanner, 1927)
(Fig. 149)

1927. *Nassa (Uzita) varicosecostata* Fischer in Wanner, Palaeont.v.Timor, Lief.15(25):77, pl.213,fig.49.

"Shell ovate-elongate, with 8 convex whorls which are separated by a wavelike suture; 2½ embryonic whorls smooth, last embryonic whorl with a few nebulous axial striae. Sculpture consists of 11 strong, rounded, oblique axial ribs and 6 weaker spiral threads which form elongated nodules upon the summits of the axial ribs; interspaces with extremely fine striae visible only under magnification; the aperture was ovate, but the outer lip is missing; siphonal canal with a strong cord." (Abridged translation).

TYPE LOCALITY. Seran I, Timor, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The location of the type-specimens of *N. varicosecostatus* (Fischer in Wanner) is not known to me. The original dimension was length 10.0 mm.

The species was based on an incomplete and possibly immature example, and only a dorsal figure has been supplied by the author (Fischer in Wanner 1927). His description of the protoconch and sculpture of shell fully agree with those of *N.pauperus* (Gould).

Nassarius (Hima) vandervlerki Oostingh, 1939
(Fig. 150)

1939. *Nassarius (Hima) vandervlerki* Oostingh, Ing.Ned.-Indie Mijnb.& Geol. 6(12)177, pl.16, fig.279.

"Protoconch conical and consisting of at least 3 smooth whorls, last whorl with a carina, post-embryonic whorls about 4½; sculptured with axial ribs and spiral grooves, ribs slightly broader than the interspaces; axial ribs *c.* 22 on penultimate whorl, ribs on body whorl almost obsolete, spirals on central whorls numbering from 5-8, base of body whorl with spiral cords, cords on siphonal fasciole broader, subsutural groove deeper and forming quadrate sutural nodules. Varix strong, interior with 9 denticles, columellar callus narrow, well bordered, and with a few small denticles and a parietal fold." (Abridged translation).

TYPE LOCALITY. Tjidilem, Tjikeusik district, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The type-specimens of *N.vandervlerki* Oostingh, are presumably in the Museum of Bandoeng, Indonesia. The original dimensions were length 9.7 mm, width 5.3 mm.

Nassarius (Hima) fuscolineatus (E.A.Smith, 1875)
(Plate 38, figs.3-6)

1875. *Nassa fuscolineata* E.A.Smith, Ann.Mag.Nat.Hist. (4), 15:423; 1895 Pilsbry, Cat.mar.Moll.Japan p.35.
1895. *Nassa (Zeuxis) varicifera* var. *fraterminor* Pilsbry, Cat.mar.Moll.Japan p.36.
1971. *Reticunassa fuscolineata* (Smith), Kuroda & Habe, Sea shells Sagami Bay p.175, pl.47, figs.15,16,20.
1974. *Nassarius (Hima) fuscolineatus* (E.A.Smith), Cernohorsky, Venus:Jap.J.Malac. 33(2):55, figs.13,14 (figd.holotype).

Shell up to 13.0 mm in length, ovate to elongate-ovate, solid, teleoconch of 5½-6 convex whorls, protoconch of 2-2½ smooth embryonic whorls; sculptured with strong, roundly angulate axial ribs which continue to the back of the outer lip and number from 11-14 on the penultimate and from 12-14 on the body whorl, some individuals with a varix on last 1-2 whorls; spiral sculpture consists of either spiral grooves which give rise to flat spiral cords or elevated overriding spiral threads which number from 4-6 on the penultimate and from 6-10 on the body whorl plus 3-4 more granulose basal cords, siphonal fasciole with 4-5 oblique cords, interspaces between cords macroscopically finely striate. Aperture narrow, shorter than the spire, outer lip thickened and strongly variced, interior with 7-8 denticles, columellar callus narrow, slightly thinner above parietal wall, and with 2-6 small denticles, siphonal notch prominent, anal canal distinct. White or cream in colour, sometimes with a pale golden-yellow tinge, spire whorls ornamented with an anterior and posterior row of brown spots in interspaces of axial ribs, body whorl with a row of brown spots at sutures and a nebulous peripheral brown band with brown spots in interspaces, siphonal fasciole and aperture white.

TYPE LOCALITY. Cape Sima, Japan, 33 m *(fuscolineatus)*; Isi, Kamakura, Japan *(fraterminor)*.

DISTRIBUTION. Known only from Japan. Intertidal and subtidal, to a depth of 33 m.

Type specimens. The slightly immature holotype of *N.fuscolineatus* (E.A.Smith), is in the British Museum (N.H.), London, No.1873.8.6.41, length 9.0 mm,width 4.6 mm. Fourteen syntypes of *Nassa fraterminor* Pilsbry, are in the Academy of Natural Sciences, Philadelphia, No.70704, and the syntype measuring length 10.6 mm, width 6.0 mm, is here selected as the lectotype (pl.38, fig.5).

Material examined. JAPAN: Inoshima, Amami; Kumikama, Tango; Echigo (all LACM); Isi, Kamakura (ANSP).

Nassarius (Hima) praematuratus (Kuroda and Habe in Habe, 1960)
(Plate 38, figs.7-10)

1852. *? Nassa japonica* A.Adams, Proc.Zool.Soc.Lond. Pt.19:110 (nomen dubium).
1870. *? Caesia japonica* A.Adams, Ann.Mag.Nat.Hist. (4), 5:426 (nomen dubium).
1874. *Nassa japonica* Lischke, Jap.Meeres-Conchyl. 3:37, pl.2,figs.20-23 (non A.Adams, 1852; nec Lischke, 1868).
1875. *Nassa tenuis* E.A.Smith, Ann.Mag.Nat.Hist. (4), 15:423 (non *Planaxis tenuis* Risso, 1826 = *Nassarius*).
1879. *Nassa (Hima) tenuis* E.A.Smith, Proc.Zool.Soc.Lond. p.211.
1895. *Nassa (Hima) japonica* (A.Ad.), Lischke, Pilsbry, Cat.mar.Moll.Japan p.36.
1932. *Nassarius japonicus* (A.Adams), Kanamura, Venus:Jap.J.Malac. 3(5):280, textfig. 57: 1936 Hirase, Cat.Jap.shells p.76, pl.106,fig.12; 1937 Nomura, Jap.J.Geol. & Geog. 14:76; 1938 Hatai & Nisiyama, Bull. Biog.Soc.Japan 8(18):269; 1982 Kaicher, Card cat.world-wide shells, Pack No.31:card 3179.
1960. *Reticunassa praematurata* Kuroda & Habe in Habe, Publ.Seto Mar.Biol.Lab. 8:296; 1964 Habe, Shells West.Pacific col. 2:98, pl.32,fig.1.
1961. *Reticunassa praematurus (sic)*, Kuroda & Habe, Habe, Col.illust.shells Japan 2:63, pl.32,fig.1.
1974. *Nassarius (Hima) tenuis* (E.A.Smith), Cernohorsky, Venus:Jap.J.Malac. 33(2):58, textfigs.15,16.

Shell up to 13.0 mm in length, elongate-ovate, spire produced, teleoconch of 5-6 convex whorls, protoconch of 2¼-2½ glassy, smooth embryonic whorls; post-embryonic whorls sculptured with prominent, close-set, thick axial ribs, axials becoming more slender towards base and may be even absent on last 1-2 whorls, and number from 2-21 on the penultimate and from 0-19 on the body whorl; spiral sculpture consists of crisp, overriding spiral threads which form narrow, laterally elongate nodules upon ribs, and number from 5-6 on the penultimate and from 10-13 on the body whorl, intervening interspaces concave, body whorl constricted basally, siphonal fasciole with 6-7 oblique cords. Aperture shorter than the spire, outer lip thickened and variced, interior with 7-11 lirate denticles, columella with a very weak and narrow callus, anterior with a prominent basal fold which often protrudes into the aperture and 2-3 smaller additional denticles, siphonal notch broad and deep, anterior of siphonal fasciole oblique. White in colour, spire whorls with an anterior and posterior rusty-brown band which is usually visible as spots in interspaces, body whorl with a sutural and peripheral brown band, back of varix with 2 brown blotches.

TYPE LOCALITY. Tomioka, Amakusa, Kumamoto Prefecture, Japan, 10-20 m *(praematuratus)*; Cape Sima, Japan, 33 m (*tenuis* E.A.Smith).

DISTRIBUTION. Known only from Japan. Subtidal to a depth of 55 m.

Type specimens. The juvenile holotype of *N.praematuratus* (Kuroda & Habe in Habe), is in the National Science Museum, Tokyo, No.NSM-39796, length 4.7 mm, width 2.5 mm. The holotype of *Nassa tenuis* E.A.Smith, is in the British Museum (N.H.), London, No.1873.8.6.40, length 12.5 mm, width 6.2 mm.

Material examined. JAPAN: Misaki (ZMC); Kobe (USNM; ZMC); Hirado, Hizen; Mogi, Wakanura, Kishiu; Yenoshima; Nagasaki (all USNM).

Fossil record. PLIOCENE: Shizui, Shimozu (NZGS).

Because of the prevailing confusion as to the correct name applicable to this species, a statement by Smith (1879a) is relevant: "the type of Adams' species *[Nassa japonica]* described from the Cumingian collection is not to be found. On this account, and considering that Adams' description is far too brief and vague for identification of the species, I am induced to retain the name *tenuis* imposed upon it by myself in the Annals of 1875". During a detailed discussion of *N.tenuis* (Cernohorsky, 1974b), it has been pointed out that a subsequent search by Tomlin (1932a) and by this author in the British Museum (Natural History), failed to discover Adams' type of his *Nassa japonica*. Reeve (1853-54) in his monograph of Nassariidae appears to have been ignorant of the identity of Adams' *Nassa japonica* and did not list it. Pilsbry (1895) did cite *N.japonica* but with an authorship of "A.Ad., Lischke". Adams' original description (1852) is in itself insufficient to identify the species since it is also applicable to several other closely related species, and actually is more compatible with *Nassarius fuscolineatus* (E.A.Smith) than *N.tenuis* (E.A.Smith). For reasons outlined above, the taxon *"Nassa japonica"* A.Adams, 1852, must be treated as a *nomen dubium*.

The name *Nassa tenuis* E.A.Smith, must also be rejected on account of its secondary homonymy of *Planaxis tenuis* Risso, 1826, which is a synonym of *Nassarius (Telasco) cuvierii* (Payraudeau, 1826). I have adopted the epithet *N.praematuratus* (Kuroda & Habe in Habe) for *N.tenuis* (E.A.Smith), since the former has been based on small, juvenile specimens of the species. The prominently ribbed and corded spire whorls, formation of siphonal fasciole and other features, clearly associate *praematuratus* with *tenuis*.

Nassarius (Hima) quantulus (Gould, 1860)
(Plate 38, figs.11-15)

1858. *Buccinum kochianum* Dunker, Kuester, Syst. Conchyl. - Cab. Martini & Chemnitz, ed.2, 3(1a):64, pl.12, figs.11,12 (non Dunker, 1846).
1860. *Nassa quantula* Gould, Proc. Boston Soc. Nat. Hist. 7:331; 1874 v. Martens, Jahrb. deut. Malak. Gesell. 1:139; 1903 E.A.Smith, Proc. Malac. Soc. Lond. 5:374; 1964 Johnson, U.S. Nat. Mus. Bull. No.239:138, pl.16, fig.3.
1915. *Alectrion quantula* Gould, Bartsch, U.S. Nat. Mus. Bull. No.91:51.
1932. *Nassa microstoma* Pease? Turton, Mar. shells Port Alfred p.58, pl.13, fig.428 (non Pease, 1860).
1932. *Nassa ambigua* Montagu?, Turton, *ibid.*, p.58, pl.13, fig.429 (non *Buccinum ambiguum* Pulteney, 1799 = *Nassarius*).
1932. *Nassa carinata* Turton, *ibid.*, p.57, pl.13, fig.419 (non J. de C.Sowerby in Sedgwick, 1833).
1959. *Nassa muiri* Barnard, Ann. Sth. Afric. Mus. 45:105; 1969 Barnard, Ann. Sth. Afric. Mus. 47(4):628, textfig.15b (figd. type); 1973 Kensley, Sea-shells South Africa p.162, fig.600.

Shell up to 13.0 mm in length, as variable in shape as *N.pauperus* (Gould), ovate to elongate-ovate, teleoconch of 4-5 distinctly convex whorls, protoconch of 3½-3¾ glassy embryonic whorls, last quarter turn of embryonic whorl with spiral threads prior to reaching first curved axial rib; sculptured with strong, rounded axial ribs which persist to the back of the outer lip and number from 14-18 on the penultimate and from 17-23 on the body whorl; spiral sculpture consists of numerous, close-set and frequently flat-topped spiral threads which override axial ribs and number from 8-10 on the penultimate and from 15-18 on the body whorl, area between body whorl and siphonal fasciole appearing like a smooth trough, interspaces between spiral threads macroscopically axially striate. Aperture small, outer lip moderately thickened but prominently variced, interior with 11-16 very small denticles, columella narrowly calloused, area above parietal wall often glazed, and either moderately smooth of with a few irregular wrinkles, siphonal notch and anal canal prominent. Cream, pale straw-yellow to light brown in colour, ornamented with irregular brown streaks, some individuals rusty-brown with a narrow white central band, varix with 2-3 brown blotches, anterior blotch usually ex-

tending on to outer lip, columella above parietal wall usually with a round brown spot. Operculum brown and simple at margins.

TYPE LOCALITY. St. Simons Bay, South Africa *(quantulus)*; Port Alfred, South Africa (*carinata* Turton); Port Alfred and other localities in South Africa *(muiri)*.

DISTRIBUTION. Known only from South Africa. Subtidal to a depth of 100 m.

Type specimens. The juvenile holotype of *N. quantulus* (Gould), is in the National Museum of Natural History, Washington, No.USNM-224, length 6.2 mm, width 3.6 mm, The type-specimens of *Nassa carinata* Turton, are in the Oxford University Museum, length of illustrated type 11.0 mm. The type-specimens of *N. muiri* Barnard, are in the South African Mueum, Cape Town, and paratypes are in the British Museum (N.H.), London.

Material examined. SOUTH AFRICA: Jeffrey's Bay; Port Alfred (both coll. Powell); Cape St. Blaize, Cape Province (Natal Mus.); Cape Agulhas, trawled (coll. Cohen); Hermansdorp, Jeffrey's Bay (coll. Ackermann).

Barnard (1959) reported *Nassa muiri* to have only 2½ embryonic whorls. His specimen must have had a worn protoconch, because numerous specimens examined had on the average 3½ embryonic whorls. The count of embryonic whorls commenced at the last trace of axial sculpture where the protoconch assumed a glassy appearance.

Nassarius (Hima) multigranosus (Dunker, 1847)
(Plate 39, figs.1-8)

1847. *Buccinum multigranosum* Dunker, Zeit.f.Malakozool.4:61; 1849 Philippi, Abb. Beschr. Conchyl. 3:67, pl.2, fig.13.
1852. *Nassa multigrana* Dunker, A.Adams, Proc. Zool. Soc. Lond. Pt.19:12 (nom. null.).
1860. *Nassa spurca* Gould, Proc. Boston Soc. Nat. Hist. 7:332; 1895 Pilsbry, Cat. mar. Moll. Japan p.36; 1964 Johnson, Bull. U.S. Nat. Mus. No.239:151, pl.16, fig. 5 (not fig.7 as stated by Johnson); 1969 Kosuge, Venus:Jap. J. Malac. 28:112.
1874. *Nassa dominula* Tapparone-Canefri, Zool. viag. freg. "Magenta", Malac. p.19, pl.1, fig.17.
1879. *Nassa (Hima) acutidendata* E.A.Smith, Proc. Zool. Soc. Lond. p.212, pl.20, fig.46.
1882. *Nassa acutidentata* Smith, Dunker, Ind. Moll. mar.Japonici p.36 (emended spelling).
1882. *Nassa (Hima) acutidentata* E.A.Smith, Tryon, Man.Conch. 5:46, pl.14, fig.242.
1895. *Nassa (Hima) dominula* Tap.-Can., Pilsbry, Cat. mar. Moll. Japan p.36.
1936. *Nassarius dominulus* (Tapparone-Canefri), Hirase, Cat.Jap. shells p.76, pl.106, fig.11; 1938 Hatai & Nisiyama, Bull. Biog. Soc. Japan 8:269.
1958. *Reticunassa acutindentatus* (Smith), Habe, Publ. Akkeshi Mar. Biol. Stat. No.8:28, pl.3, fig.4.
1960. *Reticunassa chibi* Habe, Publ. Seto Mar. Biol. Lab. 8:297; 1961 Habe, Col. illust. shells Japan 2:63, pl.32, fig.2.
1960. *Reticunassa acutidentata* (E.A.Smith), Azuma, Cat. Moll. Shikoku Japan p.42; 1962, Shells West. Pacific col.1:80, pl.29, fig.12.
1967. *Hinia (Reticunassa) beata* (Gould), Habe & Igarashi, Contrib. Fish. Mus. Hokkaido Univ. No.6:22 (non *Nassa beata* Gould, 1860).
1967. *Reticunassa beata* (Gould), Habe & Kosuge, Stand. book Jap. shells 3:75, pl.29, fig.28 (non *Nassa beata* Gould, 1860).
1971. *Reticunassa spurca* (Gould), Kuroda & Habe, Sea shells Sagami Bay p.175, pl.47, figs.17-19.
1974. *Nassarius (Hima) multigranosus* (Dunker), Cernohorsky, Venus: Jap. J. Malac.33(2):56, figs.1-6 (figd. types).

Shell up to 13.0 mm in length, but frequently smaller, elongate-ovate to almost ovate, teleoconch of 4¾-5½ convex whorls, protoconch of 1½-1¾ smooth, glassy embryonic whorls, sutures tight or narrowly incised; sculptured with close-set or slightly wider spaced axial ribs which are continuous to the back of the outer lip and tend to become only slightly weaker at this point; ribs number from 13-21 on the penultimate and from 11-18 on the body whorl; spiral sculpture consists of overriding spiral cords which tend to form nodules upon the summits of the ribs and number from 5-6 on the penultimate and from 9-11 on the body whorl, siphonal fasciole with 6-7 oblique cords. Aperture narrow, outer lip thick and strongly variced, interior with 7-9 denticles, first 2-3 posterior denticles occasionally smaller than the rest, columella narrowly calloused and with 3-8 irregular denticles and a parietal denticle, siphonal notch and anal canal distinct. Cream to pale yellowish-brown in colour, occasionally ornamented with 2-3 brown bands on body whorl, some individuals with reddish-brown spiral threads, siphonal fasciole and aperture cream to pale yellowish-brown, anal canal and anterior end of outer lip sometimes with brown spots.

TYPE LOCALITY. West Indies ? = error! *(multigranosus)*; St.Simon's Bay, South Africa = error! *(spurca)*; Yokohama, Japan *(dominula)*; Ojica Bay, Goto Is, 33°12.5'N & 129°05'E, 18 m *(acutidentata)*;

Tomioka, Amakusa, Kumamoto Prefecture, Japan, 10-20 m *(chibi)*. Hirado, Hizen, Japan, is here designated as the type locality (specimens in AMS and USNM).

DISTRIBUTION. From the Philippines to Japan. Subtidal to a depth of 128 m.

Type specimens. Two syntypes of *N.multigranosus* (Dunker), are in Dunker's collection in the Zoological Museum, Humboldt University, Berlin, and the smaller specimen, length 9.6 mm, width 6.1 mm, is here selected as the lectotype (pl.39, fig.1). The holotype of *Nassa spurca* Gould, is in the National Museum of Natural History, Washington, No.C-1661, length 10.2 mm, width 6.5 mm. The holotype of *N.acutidentata* E.A.Smith, is in the British Museum (N.H.), London, No.1873. 11.7.36, length 10.0 mm, width 5.4 mm, and the immature holotype of *Reticunassa chibi* Habe, is in the National Science Museum, Tokyo, No.39777, length 6.2 mm, width 3.5 mm. The type specimens of *Nassa dominula* Tapparone-Canefri, cannot be found in the Museo Civico di Storia Naturale, Genoa (Dr. E. Tortonese *in litt.*).

Material examined. PHILIPPINES: Cebu I (coll. Dan); JAPAN: Misaki (ZMC); Hirado, Hizen (AMS; USNM); Tesiwo, Hokkaido; Humihama, Tango; Higo; Otaru; Hakodate; Kishiu; off Honshu I, 110-128 m; Rikuzen (all USNM); Inoshima, Amami (coll. Yama).

The species has been discussed in detail by Cernohorsky (1974b). It has been pointed out that the taxon *Nassa spurca* Gould, has been revived by Johnson (1964), who unfortunately reversed the figures and illustrated the species *Nassa beata* Gould, 1860, under the name *N. spurca* Gould, and *vice versa,* which led some Japanese authors to adopt the former name for the species under discussion. *N. beata* Gould, however, is a synonym of *Nassarius sinusigerus* (A.Adams, 1852), as already realised by Gould through an appended note with the type specimens.

The types of *Nassa dominula* Tapparone-Canefri are lost, but the original type-figure and description associate the species with *Nassarius multigranosus* (Dunker), rather than *"Nassa japonica* A.Adams" (= *Nassarius praematuratus* Kuroda & Habe in Habe).

The lectotype of *N. multigranosus* (Dunker), is the broad form of the species, as is the holotype of *Nassa spurca*, the type-figure of *N. dominula* and the type specimen of *Reticunassa chibi* Habe. The latter species has been based on small individuals with fewer, more wide-spaced ribs. The paralectotype of *N. multigranosus* and the holotype of *Nassa acutidentata* are the more slender form of the species.

Nassarius (Hima) fraterculus (Dunker, 1860)
(Plate 39, figs.9-14)

1853. *Nassa semiplicata* A.Adams, Reeve, Conch.Icon. 8:pl.12,figs.78a,b (non A.Adams, 1852).
1860. *Nassa fraterculus* Dunker, Malakozool.Blaetter 6:230; 1861 Dunker, Moll.Japonica p.7, pl.1,fig.15; 1871 Lischke, Japan.Meeres-Conchyl.2:54, pl.4, figs.7,8; 1874 Tapparone-Canefri, Mem.R.Accad.Sci.Torino, (2), 28:123; 1882 Dunker, Index Moll.Mar.Japonici p.37.
1870. *Hima fraterculus* Dunker, A.Adams, Ann.Mag.Nat.Hist. (4) 5:426.
1879. *Nassa (Hima) fraterculus* Dunker, E.A.Smith, Proc.Zool.Soc.Lond. p.211; 1895 Pilsbry, Cat.Mar.Moll.Japan p.36.
1880. *Nassa nodosa* Marrat, Var.shells genus *Nassa* pp.67,77.
1895. *Nassa hypolia* Pilsbry, Cat.Mar.Moll.Japan p.37, pl.2,figs.13,14.
1904. *Nassa semiplicata hiradoensis* Pilsbry, Proc.Acad.Nat.Sci.Philadelphia 56:20, pl.4,figs.35,35a.
1904. *Nassa semiplicata hizenensis* Pilsbry, *ibid.*, 56:21, pl.4,figs.36,36a.
1946. *Nassarius (Tritonella) semiplicatus hizenensis* (Pilsbry), Habe, Venus: Jap.J.Malac. 14:193,textfig.14 (radula).
1951. *Nassarius (Tritonella) fraterculus hiradoensis* (Pilsbry), Taki, Venus:Jap.J.Malac. 16:129, textfigs.18,19 (opercula).
1954. *Tritia (Reticunassa) hiradoensis* (Pilsbry), Kira, Col.illust.shells Japan 1:56, pl.28,fig.14.
1961. *Reticunassa fraterculus* (Dunker), Habe, Col.illust.shells Japan 2:63, pl.32, fig.4.
1961. *Reticunassa fraterculus hypolius* Pilsbry, Habe, Col.illust.shells Japan 2:63, pl.32,fig.6.
1967. *Tritia fratercula* (Dunker), Golikov & Scarlato, Trudy Inst.Nauk. S.S.S.R. 42:59, pl.6,fig.3, and textfig.39 (shell and egg-cases).
1967. *Reticunassa fratercula* (Dunker), Habe & Kosuge, Stand.book Japan.shells col. 3:75, pl.29, fig.30; 1971 Kuroda & Habe, Shells Sagami Bay, p.174, pl.47, fig.21; 1979 Habe, J.Biol.Stud.Nagasaki Pref. No.18:4.
1967. *Reticunassa fratercula hiradoensis* (Pilsbry), Habe & Kosuge, Stand.book Japan.shells col. 3:75, pl.29,fig.32.

Shell up to 17.0 mm in length, elongate-ovate, teleoconch of 5¼-6 convex whorls which are occasionally subangulate on the presutural ramp, teleoconch of 1½-1¾ bulbous, smooth embryonic whorls; extremely variable in sculpture, with broad or slender axial ribs which are either continuous to the back of the outer lip or may become obsolete on body whorl, ribs number from 10-18 on the

penultimate and from 0-10 on the body whorl; spiral sculpture consists of prominent, elevated and overriding spiral cords which form coarse and laterally elongate nodules on summits of ribs, cords number from 4-8 on the penultimate and from 10-12 on the body whorl; some individuals are moderately smooth and overriding spiral cords are replaced with a few shallow spiral grooves. Aperture small, outer lip thick and variced, interior with 4-8 denticles, columellar callus slightly spreading on to siphonal fasciole, area above parietal wall frequently only glazed, columella with 2-5 small denticles and a parietal denticle, siphonal notch and anal canal distinct. Either uniformly creamy-yellow to brown in colour, some specimens brown, ornamented with a single, moderately broad white or yellow spiral band on whorl, aperture and siphonal fasciole usually whitish, aperture banded with chocolate-brown.

TYPE LOCALITY. Decima, Japan *(fraterculus)*; Chusan, China (*semiplicata* Reeve); Malacca = error! *(nodosa)*; Yesso, Japan *(hypolia)*; Hirado, Hizen, Japan *(hiradoensis* and *hizenensis)*.

DISTRIBUTION. From China to Korea and Japan. On rocky shores, from the intertidal zone to a depth of 10 m.

Type specimens. Syntypes of *N.fraterculus* (Dunker), are in the Zoological Museum, Humboldt University, Berlin, and the syntype measuring length 10.7 mm, is here designated as the lectotype (pl.39, fig.9). The holotype of *Nassa nodosa* Marrat, is in the Merseyside County Museum, Liverpool, length 16.7 mm, width 9.0 mm. The following type specimens are in the Academy of Natural Sciences, Philadelphia: sixteen syntypes of *Nassa hypolia* Pilsbry, No.70705, and the syntype measuring length 11.0 mm, width 6.0 mm, is here designated as the lectotype (pl.39, fig.13); five syntypes of *N.hiradoensis* Pilsbry, No.85999, and the specimen measuring length 15.9 mm, width 8.5 mm, is here designated as the lectotype (pl.39, fig.12); and four syntypes of *N.hizenensis* Pilsbry, No.85996, and the specimen measuring length 11.0 mm, width 5.0 mm, is here designated as the lectotype (pl.39, fig.14).

Material examined. KOREA: Pusan (USNM); JAPAN: Misaki, 9 m (ZMC); Kamoito, Teshio; Azabu; Hakodate; Akashi; Fukura, Awaji; Mutsu; Nagasaki, Tesiwo, Hokkaido; Otaru (all USNM); Hirado, Hizen (AMS; ANSP; USNM).

The species is very variable in sculpture, and although the strongly spirally corded form *hiradoensis*, and the smooth form *hypolia* may appear quite different, they are connected through *hizenensis* and other intergrading specimens to *N.fraterculus*.

Nassarius (Hima) kochianus (Dunker, 1846)
(Plate 40, figs.1-6)

1846. *Buccinum kochianum* Dunker, Zeit.f.Malakozool. 3:111; 1848 Krauss, Suedafrik.Moll. p.122.
1847. *Buccinum signatum* Dunker, Zeit.f.Malakozool. 4:61; 1849 Philippi, Abb.Beschr.Conchyl. 3:67, pl.2,fig.17; 1858 Kuester, Syst.Conchyl.-Cab.Martini & Chemnitz, ed.2, 3(1a):66, pl.12,figs.17-20.
1858. *Buccinum regulare* Kuester, Syst.Conchyl.-Cab.Martini & Chemnitz, ed.2, 3(1a):68, pl.12,figs.23,24.
1874. *Buccinum (Nassa) kochianum* Dunker, v.Martens, Jahrb.deut.Malak.Gesell. 1:139.
1886. *Nassa coccinea* Sowerby, J.Conch. 5:4; 1892 Sowerby, Mar.shells Sth. Africa p.12; 1897 Sowerby, App.Mar.shells Sth. Africa p.5.
1892. *Nassa crawfordi* Sowerby, Mar.shells Sth. Africa p.13, pl.4,fig.86; 1904 E.A.Smith, J.Malac. 11:23.
1897. *Nassa kochiana* Dunker, Sowerby, App.Mar.shells Sth. Africa p.5; 1959 Barnard, Ann.Sth. Afric.Mus. 45:104, fig.22b (radula), fig.23b (protoconch); 1973 Kensley, Sea-shells Sth. Africa p.160, fig.597.
1900. *Nassa incrassata* Sowerby, Proc.Malac.Soc.Lond. 4:3 (non *Buccinum incrassatum* Ström, 1768 = *Nassarius*).
1903. *Nassa (Hima) crawfordi* Sowerby, v.Martens, Wiss.Ergeb.deut.Tief.-Exped."Valdivia" 7:28.
1904. *Nassa poecilosticta* E.A.Smith, J.Malac. 11:33, pl.2,fig.16.
1915. *Alectrion kochiana* Dunker, Bartsch, U.S.Nat.Mus.Bull.No.91:51.
1915. *Alectrion crawfordi* Sowerby, Bartsch, *ibid.* No.91:51.
1928. *Nassarius kochianus* (Dunker) [pars] Tomlin, Ann.Sth. Afric.Mus. 25(2):319, 327.
1932. *? Nassa fuscoalba* Turton, Mar.shells Port Alfred p.57, pl.13,fig.421.
1932. *Nassa eucosmia* Turton, *ibid.*, p.56, pl.13, fig.417.
1959. *Nassa poecilostoma (sic)* Barnard, Ann.Sth. Afric.Mus. 45:105.

Shell up to 15.0 mm in length, elongate-ovate to ovate, spire long, teleoconch of 5-5¾ convex whorls, whorls occasionally constricted anteriorly, protoconch of *c.* 3 smooth embryonic whorls, presutural ramp concave; sculptured with slender, angulate and usually distinctly oblique axial ribs which continue to the back of the outer lip but become weaker just anteriorly to sutures; spiral sculpture consists of numerous, overriding spiral threads, 2-4 spiral threads anterior to sutures appearing to be continuous due to the weakening of axial ribs, 3-4 anterior basal cords somewhat granulose, siphonal fasciole with 6-8 oblique cords. Aperture shorter than the spire, outer lip moderately thickened and narrowly variced, interior denticulate-lirate, columella concave, narrowly weakly calloused, anterior-

ly with a single fold and smooth or with a few weak denticles, siphonal notch and anal canal distinct. White, cream or buff in colour, variously ornamented with a broad, orange-brown band on lower half of body whorl, spots of same colour in interspaces, some individuals with brown-lined spiral cords, aperture white, anal canal, anterior edge of outer lip and siphonal canal occasionally with a brown spot. Operculum brown and simple at margins.

TYPE LOCALITY. Cape of Good Hope, South Africa *(kochianus* and *regulare)*; East Indies = error! *(signatum)*; Port Elizabeth, South Africa *(coccinea* and *crawfordi)*; Port Alfred, South Africa *(poecilosticta; fuscoalba* and *eucosmia)*.

DISTRIBUTION. From False Bay to Port Alfred, South Africa. In shallow water, to a depth of 24 m.

Type specimens. Worn syntypes of *N.kochianus* (Dunker), are in the Zoological Museum, Humboldt University, Berlin, and the specimen measuring length 10.3 mm, which has a varix on the penultimate whorl, is here selected as the lectotype (pl.40, fig.1). A syntype (erroneously marked as "holotype") of *Buccinum signatum* Dunker, is in the same Institution, length 10.9 mm. Three syntypes of *Nassa crawfordi* Sowerby, are in the British Museum (N.H.), London, No.1899.4.14.3676-78, and the specimen measuring length 9.8 mm, width 4.9 mm, is here selected as the lectotype (pl.40, fig.4). The holotype of *N.poecilosticta* E.A.Smith, is in the same Institution No.1894.4.14.464-467, length 13.8 mm, width 7.3 mm. The type-specimens of *N.eucosmia* Turton, and *N.fuscoalba* Turton, are in the Oxford University Museum, and the types of *Buccinum regulare* Kuester, and *Nassa coccinea* Sowerby, could not be found.

Material examined. SOUTH AFRICA: Algoa Bay (USNM); Sea Point (AIM); Hermansdorp, Jeffrey's Bay (USNM); Jeffrey's Bay (SDMNH; coll.Meyer); the Kowie (USNM); mouth of Kowie river (SDMNH); Port Alfred (LACM; USNM).

Tomlin (1928) gave an expanded synonymy for this species, a synonymy with which I agree with the exception of *Nassarius quantulus* (Gould), which is now considered to be a good species. The species has been described 8 times as new to science, due to its variability in size, form, sculpture and colouring.

Nassarius (Hima) plebejus (Thiele, 1925)
(Plate 40, figs.7,8)

1925. *Nassa plebeja* Thiele, Wiss.Ergeb.deut.Tief-Exped."Valdivia" 17:182, pl.20 (32), fig.9; 1959 Barnard, Ann.Sth.Afric.Mus. 45:106; 1973 Kensley, Sea-shells South Africa p.162, fig.602.

Shell up to 10.0 mm in length but frequently smaller, broadly elongate-ovate, teleoconch of 4½ convex whorls, protoconch of 2½ smooth, glassy embryonic whorls, sutures well marked; sculptured with slender or broader and more angulate axial ribs which have the tendency to become obsolete on lower half of the body whorl and number from 14-15 on the penultimate and from 13-15 on the body whorl; spiral sculpture consists of overriding spiral cords, 2-3 cords anterior to suture somewhat nodulose, cords number 5-6 on the penultimate and up to 12 on the body whorl, cords occasionally obsolete on centre of body whorl, especially the dorsal side. Aperture narrow, outer lip thickened and prominently variced, interior with 10-11 small denticles, columella concave and not calloused, smooth apart from a few obsolete striae, siphonal notch very deep, end of siphonal canal slightly concave, parietal denticle moderately weak. Cream in colour, body whorl with 1-2 very faint brown bands, a sutural row and central row of brown spots in interspaces, back of outer lip with 1-2 spots, right side of siphonal canal stained with brown.

TYPE LOCALITY. Great Fish Bay, Angola, West Africa; Francis Bay, South Africa, 80 m, and Algoa Bay, South Africa. The lectotype originated from Algoa Bay, South Africa.

DISTRIBUTION. From southern Angola, West Africa to South Africa. Subtidal, to a depth of 83 m.

Type specimens. Several syntypes of *N.plebejus* (Thiele), are in the Zoological Museum, Humboldt University, Berlin, and the specimen from Algoa Bay, length 6.2 mm, is here selected as the lectotype (pl.40, fig.7).

Material examined. SOUTH AFRICA: Jeffrey's Bay; off Fish Hoek, 18-22 m; Port Elizabeth, dredger dump (all Natal Mus.).

Nassarius (Hima) capensis (Dunker, 1846)
(Plate 40, figs.9-11)

1846. *Buccinum capense* Dunker, Zeit.f.Malakozool. 3:110; 1858 Kuester, Syst.Conchyl.-Cab.Martini & Chemnitz, ed.2, 3(1a):64, pl.12,figs.13-16.
1852. *Nassa serotina* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108; 1892 Sowerby, Mar.shells Sth. Africa p.12; 1904 E.A.Smith, J.Malac. 11:23.

1852. *Nassa pulchella* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108; 1853 Reeve, Conch.Icon. 8:pl.14,figs.90a,b; 1886 Sowerby, J.Conch. 5:4; 1904 E.A.Smith, J.Malac. 11:23 (non *N.pulchella* Andrzejowski, 1833; nec Grateloup, 1834).
1853. *Nassa cerotina (sic)* A.Ad., Reeve, Conch.Icon. 8:pl.16, fig.107; 1886 Sowerby, J.Conch. 5:4.
1874. *Buccinum (Nassa) capense* Dunker, v.Martens, Jahrb.deut.Malak.Gesell.1:138.
1892. *Nassa capensis* Dunker, Sowerby, Mar.shells Sth. Africa p.12.
1915. *Alectrion capensis* Dunker, Bartsch, U.S.Nat.Mus.Bull. 91:51.
1915. *Nassa cerotina* Reeve, Bartsch, U.S.Nat.Mus.Bull. 91:52.
1928. *Nassarius capensis* (Dunker), Tomlin, Ann.Sth. Afric.Mus. 25(2):315.
1932. *Nassa kraussi* Turton, Mar.shells Port Alfred p.55, pl.12,fig.412.
1932. *? Nassa albanyana* Turton, *ibid.*, p.57, pl.13,fig.420.
1932. *Nassa ordinaria* Turton, *ibid.*, p.58, pl.13,fig.425.
1932. *? Nassa erecta* Turton, *ibid.*, p.57, pl.13, fig.423.
1959. *Nassa capensis* (Dunker), Barnard, Ann.Sth. Afric.Mus. 45:103, fig.23a (protoconch); 1969 Barnard, Ann.Sth. Afric.Mus. 47:626; 1973 Kensley, Sea-shells South Africa p.160, fig.589.

Shell up to 17.0 mm in length, elongate-ovate, spire acuminate, teleoconch of 5½-6¼ convex whorls, protoconch of *c.* 2¾ smooth embryonic whorls, sutures moderately adpressed; sculptured with moderately stout, straight or slightly arcuate axial ribs which continue to the back of the outer lip; post-embryonic whorls with 4-5 weak spiral cords, cords becoming progressively more obsolete towards body whorl where they are either absent altogether or only weakly indicated anteriorly to suture on axial ribs, base of body whorl with 2 prominent, flattish nodulose spiral cords, siphonal fasciole with 5-7 oblique cords. Aperture considerably shorter than spire, narrow, outer lip distinctly variced and denticulate-lirate in interior in adult individuals, columellar callus slightly spreading on to body whorl and somewhat glazed above parietal wall, columella with a basal fold, rest smooth or with a few feeble denticles, siphonal notch and anal canal distinct. Uniformly cream, pale straw-yellow to brown in colour, but generally cream and ornamented with an interrupted brown spiral line on whorls and speckled with irregular white and brown spots, some individuals with a moderately broad brown band on body whorl, siphonal notch and aperture white, back of varix with brown spots, right side of siphonal canal stained with brown.

TYPE LOCALITY. Cape of Good Hope, South Africa *(capensis* and *pulchella)*; Australia = error! *(serotina)*; Port Alfred, South Africa *(kraussi; erecta; albanyana* and *ordinaria)*.

DISTRIBUTION. From the Cape of Good Hope to Coffee Bay, Transkei coast, South Africa. In sand, among rocks, depth unknown.

Type specimens. Syntypes of *N.capensis* (Dunker), are in the Zoological Museum, Humboldt University, Berlin, and the syntype measuring length 14.3 mm, is here designated as the lectotype (pl.40, fig.9). Three syntypes of *Nassa pulchella* A.Adams, are in the British Museum (N.H.), London, (no number), and the specimen measuring length 16.3 mm, width 6.8 mm, is here selected as the lectotype (pl.40, fig.10). The holotype of *N.serotina* A.Adams, is in the same Institution No.1973149, length 16.0 mm, width 6.5 mm. The type-specimens of *N.kraussi* Turton, *N.erecta* Turton, *N.albanyana* Turton and *N.ordinaria* Turton, are all in the Oxford University Museum.

Material examined. SOUTH AFRICA: Knysna; Coffee Bay, Ngaduli district (both coll.Powell); Port Alfred; Albany; Cape of Good Hope; Algoa Bay (all USNM); Port Elizabeth (SDMNH; USNM); mouth of Kowie river (SDMNH); Jeffrey's Bay (coll.Meyer).

N.capensis is occasionally confused with *N.kochianus* (Dunker), but the latter species has oblique axial ribs, a dense spiral sculpture and 5-6 nodulose spiral striae at the base of the body whorl. *N.capensis* always has only 2 prominent, flattish nodulose cords at base.

Nassarius (Hima) formosus (Turton, 1932)
(Plate 40, figs.12-14)

1932. *Nassa formosa* Turton, Mar.shells Port Alfred p.55, pl.12,figs.409,409.

"The shape of the shell is narrowly conic; 2 smooth nuclear whorls, the remaining 5 distinctly convex with very deep sutures. The surface is marked by 13 axial ribs, about as wide as the spaces between them; there is no spiral sculpture. The colour is light brown, with 2 interrupted dark lines on the whorls, and the size is 9 x 4 mm. It grows a little larger, up to 12 mm. It is near *pulchella* [= *capensis*], but differs in having convex whorls and deep sutures. It is a very pretty shell, and very rare." (Original description).

TYPE LOCALITY. Port Alfred, South Africa.

DISTRIBUTION. From Port Alfred to Durban, Natal, South Africa. In crevices, on the underside of rocks (fide Dr. R.Kilburn *in litt.*).

Type specimens. The holotype of *N.formosus* (Turton), is in the Oxford University Museum, length 9.0 mm, width 4.0 mm.

Material examined. SOUTH AFRICA: Gonubie, East London; Coffee Bay, Ngaduli district; Vetch's Pier, Durban, Natal (all Natal Mus.); Shelly Beach, 8 km south of Port Shepstone, Natal (coll.Meyer).

Turton's (1932) description and original illustration contradict each other. The author stated that the species had no spiral sculpture, yet the original figure clearly shows spiral threads on the walls of the axial ribs. He described his species as "light brown with 2 interrupted dark lines", yet the illustration shows a very dark shell with 2 white interrupted spiral lines in the dorsal view of the body whorl. I suspect that there was a reversal in the printing process from negative to positive. The apex of the shell is clearly worn, and Turton's count of 2 embryonic whorls is incorrect, fresh specimens show just a fraction over 3 embryonic whorls.

Barnard (1959) and Kensley (1973) obviously combined this form with *N.capensis* and they report the species range from False Bay to Tongaat in Natal. Dr. R.Kilburn *(in litt.)*, maintains that *N.capensis* and *N.formosus* are distinct species and that in fact *formosus* replaces *capensis* in the Transkei-Natal region, without any intergrading. He states further that *N.capensis* burrows in sand among rocks, while *formosus* lives in crevices on the underside of rocks. A specimen labelled *"N.formosus"* by Dr. Kilburn from Coffee Bay, Transkei coast, is here illustrated (pl.40, fig.13). This specimen also has the 2 nodulose flattish cords at the base of the body whorl so typical of *N.capensis*.

A comparison between the two taxa can be made only on the basis of specimens collected devoid of animal, and such comparisons are not always reliable. As late as 1959, Barnard stated that it is remarkable that no living specimens of *N.capensis* have been collected. From the material available to me, the differences between *N.capensis* and *N.formosus* appear to be as follows: the latter is smaller, only about half the size of *capensis*, and is shorter and less acuminate, with a more pronounced spiral sculpture, more convex whorls which are more constricted at sutures, and the whorls also have a tendency of becoming weakly subangulate on the presutural ramp, the columellar callus is more distinctly bordered and less spreading near the parietal wall, and the 2 strong basal cords so typical of *capensis* are also present in *formosus*. The shell is golden-brown, spire whorls have an interrupted dark brown spiral line posterior to suture and the body whorl has one well-defined interrupted brown spiral line at the periphery of the body whorl and another, less defined spiral line a short distance anteriorly.

From material available to me, it appears that *N.capensis* and *N.formosus* are sympatric at Port Alfred and Coffee Bay. More research is required to confirm *N.formosus* as a valid biospecies.

Nassarius (Hima) prianganensis Altena and Beets, 1945
(Figs. 151,152)

1945. *Nassarius (Alectrion) prianganensis* Altena & Beets, Verh.Geol.-Mijnb.Nederl.& Kolon. Geol., 14:42, figs.4-9.

"Of this species we have 9 more or less well preserved shells, which have an acuminate-ovate form with a maximum of 7½ whorls which are separated by distinct sutures. Post-embryonic whorls have numerous axial ribs which are bisected by a strong subsutural groove which gives rise to a row of sutural nodules; this is followed by a weaker groove and they are separated by moderately broad, flat spiral threads which produce more or less distinct nodules on summits of ribs.

Body whorl with 14-17 axial ribs (varix included), other whorls ± 12 (holotype), ± 19 (paratype), etc., actually ranging from 12-22 axial ribs; last whorl with 10 spiral grooves. Aperture ovate, with a short siphonal canal. The interior of the outer lip with a few (6-9 ?) indistinct and often irregular denticles. Columella thin, slightly spreading above parietal wall, slightly laminate anteriorly and with up to 3 small wrinkles, parietal denticle present, siphonal notch deep." (Abridged original description).

TYPE LOCALITY. Tji Gugur, Priangan, West Java, Neogene of Indonesia.

DISTRIBUTION. Neogene of Indonesia.

Type specimens. The holotype of *N.prianganensis* Altena & Beets, is in the Geological Institute, Amsterdam, original dimensions, length 7.8 mm.

Nassarius (Hima ?) hemipolitus Nomura and Zinbo, 1935

1935. *Nassarius (Hima) hemipolitus* Nomura & Zinbo, Saito Ho-On Kai Mus.Res.Bull.Univ.Sendai No.6:177, pl.15,figs.19,20.

"Shell small, ovate; test solid with seven whorls. Nuclear whorls three, smooth and rounded. Post-nuclear whorls slightly convex in the middle, and shouldered at the summit, marked by rather strong axial ribs, which are about equal to, or slightly narrower than their interspaces in breadth.

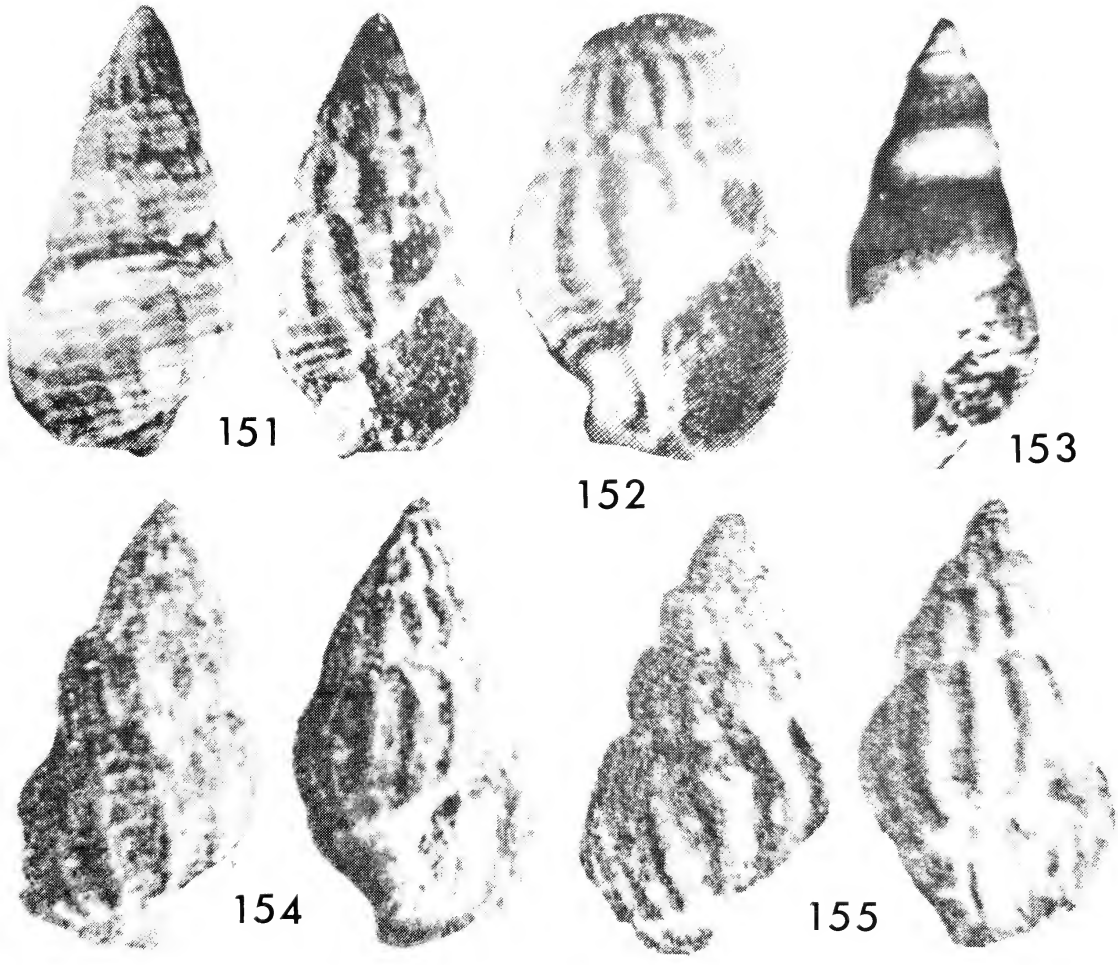
Of these about ten occur upon the last whorl; surface also marked by numerous, fine spiral threads which are seen only under magnification. Suture distinctly impressed, but not canaliculated. Periphery of the last whorl well rounded, passing gradually into a short and rounded base; fasciole distinct, bounded behind by a groove, and marked with a few spiral threads. Aperture ovate, more or less oblique, about half of shell-height, slightly sinuated above, being continued with a short, broad and curved canal below. Outer lip thickened by a terminal varix, its inner side unknown. Inner lip thick, smooth with narrowly spread callosity whose margin is free; columella short, terminated by a oblique subtruncation." (Original description).

TYPE LOCALITY. Yanagawa-machi, Fukushima Prefecture, Hukusima Basin, N.E. Honsyu, Yanagawa formation, Miocene of Japan.

DISTRIBUTION. Miocene of Japan.

Type specimens. The syntypes of *N.hemipolitus* Nomura & Zinbo, are in the Saito Ho-On Kai Museum, Sendai, No.6184, dimensions length *c.* 8.6 mm, width 5.2 mm.

The original illustration of the types is not very good and is unsatisfactory for reproduction.



Figs. 151-155. Fossil Nassariinae. 151,152. *Nassarius (Hima) prianganensis* Altena & Beets. 151. Type-figure of holotype; 7.8 mm. 152. Incomplete paratype (from Altena & Beets, 1945, figs.4,5). 153. *N. (H.) hongoensis* Itoigawa. Type-figure; 11.0 mm. 154,155. *N. (H.) notoensis* Masuda. 154. Holotype Tohoku University Sendai, No. 1538; 6.5 mm. 155. Paratype.

Nassarius (Hima ?) perdominulus Nomura and Zinbo, 1935

1935. *Nassarius (Hinia) perdominulus* Nomura & Zinbo, Saito Ho-On Kai Mus.Res.Bull. Sendai 6:177, pl.15, figs.16,17.

"Shell small, ovate, test solid; axially ribbed and spirally threaded, consisting of six, rapidly increasing whorls. Spire short, conic, shorter than the body-whorl. Nuclear whorls two, smooth, rounded. Post-nuclear whorls more or less shouldered at the summit, feebly convex in the middle, marked by strong axial ribs, about ten or eleven on a whorl, nearly vertical, or a trifle oblique to the right side; interspaces somewhat variable in width, some are narrower and some wider than the ribs themselves, but, generally speaking, they are almost equal to the width of the ribs. Surface also covered by rather distinct spiral threads and alternating grooves, the latter much wider than the former. Suture impressed, but not canaliculated. Body-whorl large, convex; base rounded. Dasciole well defined behind by a revolving groove, with many fine spiral lines on it. Aperture ovate; outer lip thickened by a terminal varix, with a convex curvature, inner side of it unknown; columella short, concave above, more or less obliquely truncate below; inner lip smooth with moderately heavy, but narrowly spread callosity and its margin free." (Original description).

TYPE LOCALITY. Yanagawa-machi, Fukushima Prefecture, Hukusima Basin, N.E. Honsyu, Yanagawa formation, Miocene of Japan.

DISTRIBUTION. Miocene of Japan.

Type specimens. The syntypes of *N.perdominulus* Nomura & Zinbo, are in the Saito Ho-On Kai Museum, Sendai, No.6183, dimensions of largest specimen length *c.* 9.0 mm, width 5.5 mm.

The specimen was described from badly preserved examples and the original illustrations are too poor for reproduction.

Nassarius (Hima) notoensis Masuda, 1956
(Figs. 154,155)

1956. *Nassarius notoensis* Masuda, Trans.Proc.Palaeont.Soc.Japan, N.S. 21:164, pl.26,figs.13a,b;14a,b.

"Shell small in size, rather thick, globose, stout, consisting of about 7 whorls; apical angle about 40°. Whorls moderately inflated, separated from each other by distinctly impressed sutures; ornamented with smooth longitudinal ribs and numerous faint spiral threads; ribs suboblique, numbering about 13 on body whorl, diminishing their number towards upper whorls, and separated by interspaces much wider than ribs themselves; interspaces between ribs sculptured with fine incremental lines and spiral threads. Body whorl large, convex, contracted below; basal fasciole distinct. Aperture roundly ovate, oblique, with deeply notched anterior canal, posterior angle acute; outer lip thick, smooth within; inner lip smooth with narrowly spread rather thick callus." (Original description).

TYPE LOCALITY. Tokunari, Machino-machi, Fugeshi-gun, Noto Peninsula, Higashi-Innai formation, Miocene of Japan.

DISTRIBUTION. Miocene of Japan.

Type specimens. The holotype of *N.notoensis* Masuda, is in the Geology Department, Tohoku University, Sendai, No.1538, length 6.5 mm, width 3.7 mm.

The author compared his new species to *N.perdominulus* Nomura & Zinbo, 1935, and *N.hemipolitus* Nomura & Zinbo, 1935.

Nassarius (Hima ?) hongoensis Itoigawa, 1955
(Fig. 153)

1955. *Nassarius hongoensis* Itoigawa, Mem.Coll.Sci.Univ.Kyoto, ser.B, 22:142, pl.6,fig.19.
1981. *Reticunassa hongoensis* (Itoigawa), Itoigawa et al. Mon.Mizunami Fossil Mus. pl.38, figs.13a,b; 1982 Itoigawa et al., *ibid.*, No.3B:229.

"Shell small, elongate ovate, solid, cancellated; spire turreted, higher than the aperture, outline slightly convex; protoconch of 3 smooth, convex whorls; whorls 5, slightly convex, sculptured with spiral striae and axial ribs; spirals fine, 8 in number, wider than interspace, the subsutural ones broad and granulose; axial ribs suboblique, 25 on the penultimate whorl, their interspaces nearly equal to them; body whorl convex, contracted below, with 14-15 spiral cords; fasciole defined with a spiral shallow groove, with 2 distinct grooves on the surface; aperture ovate, suboblique, slightly channeled above and with a short deep reflected canal below; columella long and concave, with a distinct basal fold; inner margin unknown." (Original description).

TYPE LOCALITY. Kamigiri, Mizunami group, Iwamura Basin, Kubohara sandstone, Miocene of Japan.

DISTRIBUTION. Miocene of Japan.

Type specimens. The holotype is in the Geology Department, Kyoto University, No.JC-1300072, length 11.0 mm, width 5.0 mm.

The illustrated holotype of *N.hongoensis* is a juvenile individual.

Subgenus **Allanassa** Iredale, 1929

Allanassa Iredale, 1929, Mem.Queensland Mus. 9:289, 295. Type species by OD *Nassa eximia* A.Adams,, 1872. Recent, West Pacific.

Shell small, up to 8.0 mm in length, elongate-fusiform, whorls prominently inflated and convex, sculptured with bisecting axial and spiral threads of about equal strength to render shell minutely beaded. Spire long, aperture short, outer lip variced, interior with minute denticles, columella not calloused, concave and with only 0-3 small denticles, siphonal canal narrow, constricted and oblique.

Radula and operculum unknown.

GEOGRAPHICAL DISTRIBUTION. Tropical Pacific.

STRATIGRAPHICAL RANGE. Recent.

The subgenus is monotypic and closely approximates some species of the subgenus *Aciculina* A.Adams, 1853. Once the radula and operculum are known, *Allanassa* may have to be merged with *Aciculina*.

Nassarius (Allanassa) eximius (H.Adams, 1872)
(Plate 41, figs.1,2)

1872. *Nassa eximia* H.Adams, Proc.Zool.Soc.Lond. p.14, pl.3,fig.28.
1895. *Nassa (Hima) eximia* H.Adams, Melvill & Standen, J.Conch. 8:107.
1929. *Allanassa eximia* (H.Adams), Iredale, Mem.Queensland Mus. 9:289,295.
1978. *Nassarius (Allanassa) eximius* (H.Adams), Cernohorsky, Trop.Pacific Mar.shells p.90, pl.28,fig.5.
1982. *Nassarius eximius* (H.Adams), Kaicher, Card cat.world-wide shells, Pack No.31: card 3166.

Shell up to 8.0 mm in length, fragile, elongate-ovate, teleoconch of 3¾-4¼ moderately large, inflated convex whorls, protoconch of 3¼-3½ glassy, embryonic whorls, last two finely carinate; sculptured with bisecting axial and spiral threads of about equal strength to give the shell an overall beaded appearance; the minute beads are arranged in 40-45 axial and 10-11 spiral rows on the penultimate and from 30-40 axials and 16-19 spirals on the body whorl, siphonal fasciole with 5-6 oblique cords. Aperture small, considerably shorter than the spire, outer lip with a prominent varix, interior with 10-14 small denticles, last anterior denticle larger, columella not calloused, concave, anterior with a basal fold and occasionally 1-2 small denticles, siphonal canal narrow, constricted and oblique, siphonal fasciole short, anal canal distinct in mature specimens. Translucent-white to pale yellow in colour, occasionally with a golden sheen, spire whorls with 2, body whorl with 3 orange to brown spiral bands, siphonal fasciole white.

TYPE LOCALITY. New Hebrides, Pacific Ocean.

DISTRIBUTION. From the Philippines to Niue I, Pacific Ocean. Subtidal, to a depth of 200 m.

Type specimens. Two syntypes of *N.eximius* (H.Adams), are in the British Museum (N.H.), London, No.1878.1.28.31., and the larger syntype measuring length 8.1 mm, width 4.0 mm, is here selected as the lectotype (pl.41, fig.1).

Material examined. PHILIPPINES: Punta Engano, Mactan I, Cebu, *c.* 200 m (coll.Marrow); SOLOMON IS: Aoki Harbour, W. coast of Malaita, 3-8 m (AMS); NEW HEBRIDES: Dry Creek Beach, S.E. Efate I (coll.Willan); LOYALTY IS: Lifu I (AIM; AMS; NMV; SDMNH; USNM); NEW CALEDONIA: Prony Bay (AIM); FIJI IS: Ogea I, Lau group (coll.Northgrove); NIUE I: (coll. McDowall).

Subgenus **Aciculina** A.Adams, 1853

Aciculina A.Adams, 1853, Proc.Zool.Soc.Lond. Pt.19:114. Type species by SD (Cossmann, 1901) *Nassa vittata* A.Adams = *Nassa (Aciculina) vittata* A.Adams 1853. Recent, Indo-Pacific. [publ. 29 August 1853].

1853. *Aciculina* H. & A.Adams, Gen.Rec.Moll. 1:121 [publ. August 1853].
1914. *Hannonia* Pallary, Expl.Sci.Maroc.Miss.zool. Malac. 2:36. Type species by M *Nassa tingitana* Pallary, 1901. Recent, Morocco. (non *Hannonia* Hoek, 1881).

Shell up to 15.0 mm in length but frequently smaller, elongate-ovate, often terebriform in shape, spire long, whorls flat to convex; sculptured with axial ribs and spiral grooves, aperture very short and narrow, columella calloused but not expanded, parietal denticle prominent, columella denticulate anteriorly, outer lip variced and denticulate.

Radula typically nassariine with multicuspid rachidians, simple bicuspid laterals and a small ovate intermediate lateral accessory plate.

GEOGRAPHICAL DISTRIBUTION. Tropical Indo-Pacific and Eastern Atlantic.

STRATIGRAPHICAL RANGE. Pliocene to Recent.

The subgenus contains 8 living and 1 fossil species. Although the type-species of *Aciculina* has a shiny, terebriform, moderately smooth shell, there is a transition via *N.sumatranus* (Thiele) to the more coarsely sculptured *N.moestus* (Hinds). Species of *Aciculina* inhabit shallow waters of tropical Indo-Pacific reefs.

Nassarius (Aciculina) vittatus (A.Adams, 1853)
(Plate 41, figs.3-10)

1853. *Nassa (Aciculina) vittata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:114; 1933 Dautzenberg & Bouge, J.Conchyl. 77:216; 1955 Marche-Marchad, J.Conchyl.95:30.
1853. *Nassa (Aciculina) glabrata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:114; 1933 Dautzenberg & Bouge, J.Conchyl. 77:212; 1938 Adam & Leloup, Mem.Mus.R.d'Hist.Nat.Belg. 2:184 (non *Strombus glabratus* Sowerby, 1842 = *Nassarius*).
1853. *Nassa (Aciculina) maculata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:114; 1899 Melvill & Sykes, Proc.Malac.Soc.Lond. 3:221.
1853. *Nassa maculata* A.Adams, Reeve, Conch.Icon. 8:pl.16,fig.103; 1934 Mari, J.Conchyl. 78:50.
1853. *Nassa glabrata* A.Adams, Reeve, Conch.Icon. 8:pl.24,fig.157; 1934 Mari, J.Conchyl. 78:49.
1853. *Nassa vittata* A.Adams, Reeve, Conch.Icon. 8:pl.24, figs.160a,b; 1907 Dautzenberg & Fischer, J.Conchyl. 54:154.
1934. *Nassa maculata* var. *vittata* A.Adams, Mari, J.Conchyl. 78:50.
1939. *Nassarius (Aciculina) steenhuisi* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):169, pl.15,fig.263.
1972. *Nassarius (Aciculina) vittatus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:188, figs.161,162; 1978 Cernohorsky, Trop.Pacific mar.shells, p.90, pl.28,fig.8.

Shell up to 13.0 mm in length, elongate-ovate, solid, spire acuminate, teleoconch of 4¾-5½ weakly convex whorls, protoconch of 4-4¼ glassy embryonic whorls, last two finely carinate; some individuals are sculptured with angulate axial ribs while others lack axial sculpture altogether; spiral sculpture consists of a subsutural groove which produces sutural nodules in axially ribbed specimens or a smooth sutural girdle in specimens lacking axial sculpture, and 2-3 finely incised and macroscopically pitted spiral striae on the penultimate and 3-4 on the body whorl, striae occasionally obsolete, base of shell with 3-4 spiral cords, siphonal fasciole with 4-6 oblique cords. Aperture small, short, outer lip thick and prominently variced, interior with a few minute denticles, columella concave and partly spreading on to body whorl, area above parietal wall frequently only glazed, columella with a basal fold and 2-4 small denticles, siphonal notch distinct, anal canal prominent and usually with a narrow channel extending on to back of outer lip. White in colour, ornamented with chocolate-brown to blackish-brown, often interrupted spiral bands and occasionally nebulous, curved axial streaks, edge of outer lip with 2-3 brown blotches, anterior blotch usually extending into aperture, columellar callus white, aperture brown-banded. Operculum orange-brown and minutely serrate at margin.

Radula ribbon examined contained 49 rows of teeth + 3 rows of nascentes in a ribbon 3.8 mm in length. Rachidians with 11 regular denticles, lateral teeth simple and bicuspid, small ovate accessory lateral plate present (Fig.36).

TYPE LOCALITY. Ticao I, Philippines, 11 m *(vittatus)*; Philippines (*glabrata* A.Adams); Banang, Sargassinan, Luzon I, Philippines *(maculata)*; Pasir Tjadas, Sth. Bantam, Java, Pliocene of Indonesia *(steenhuisi)*.

DISTRIBUTION. From Reunion I to India and throughout the tropical Indo-Pacific to the Marquesas Is. In sand, on reefs, from the intertidal zone to a depth of 20 m.

Type specimens. The following type-specimens are in the British Museum (N.H.), London: the holotype of *N.vittatus* (A.Adams), No.1973162, length 11.4 mm, width 5.0 mm; three syntypes of *Nassa glabrata* A.Adams, No.197340, and the syntype measuring length 10.0 mm, width 4.4 mm, is here selected as the lectotype (pl.41, fig.5); three syntypes of *N.maculata* A.Adams, No.1973161, and the specimen measuring length 13.0 mm, width 5.7 mm, is here selected as the lectotype (pl.41, fig.6). The type-specimens of *Nassarius steenhuisi* Oostingh, is presumably in the Museum of Bandoeng, Indonesia.

Material examined. REUNION I: Cap la Houssaye, 20 m (coll.Martin); INDIA: Puri (ZSI); SRI LANKA: (AMS); Colombo (NMV; coll.Powell); ANDAMAN IS: (ZSI); THAILAND: Khan Nu Paknam, Gulf of Thailand (USNM); INDONESIA: Pelaboean Ratoe, Java; Tanjong Aru, Jesselton, N. Borneo (both USNM); Kuta Beach, Bali; Nusa Dua, Bali (both coll.McCausland); PHILIPPINES: Manila (AMS); Cabra I, Lubang I (coll.Norton); PAPUA NEW GUINEA: Rabaul and Nonga, both New Britain (coll.Parkinson); MARQUESAS IS: Nuku Hiva, 2-3 m (coll.Trondle); Atuona (coll.Busson).

Fossil record. PLIOCENE: Pasir Tjadas, Sth. Bantam, Java, Indonesia (type locality of *steenhuisi* Oostingh).

The typical form of *N. vittatus* as represented by the holotype is the axially ribbed form, *glabrata* is the smooth form and the *maculata* and *steenhuisi* forms are smooth on the spire whorls but weakly ribbed on the body whorl.

Nassarius (Aciculina) labiatus (A.Adams, 1853)
(Plate 41, figs.11-13)

1853. *Nassa (Aciculina) costata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:114; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:42 (non S.V.Wood, 1848; nec A.Adams, 1852).
1853. *Nassa (Aciculina) labiata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:114 (publ.April 1853).
1853. *Nassa labiata* A.Adams, Reeve, Conch.Icon. 8:pl.24,fig.159; 1934 Mari, J.Conchyl. 78:49.
1853. *Nassa terebroides* Reeve, Conch.Icon. 8:pl.24,fig.161 (nom.subst.pro *N.(A) costata* A.Adams, 1853) [publ.December 1853]; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:97.
1941. *Nassarius (Zeuxis) labiatus* (A.Adams), Kuroda, Mem.Fac.Sci.Agric.Taihoku Imp.Univ.Geol. 22(4):118, pl.13, fig.11.
1972. *Nassarius (Aciculina) labiatus* (A.Adams), Cernohorsky, Rec.Auckland Inst.Mus. 9:189, fig.160; 1972 Cernohorsky, Mar.shells Pacific 2:152, pl.45, fig.5.
1982. *Nassarius labiatus* (A.Adams), Kaicher, Card.cat.world-wide shells, Pack No.31: card 3187.

Shell up to 15.0 mm in length, fusiformly-elongate and terebriform in shape, teleoconch of 5¼-6¾ weakly convex whorls, protoconch of 4-4¼ glassy, finely carinate embryonic whorls; sculptured with regular, angulate axial ribs which number from 13-18 on the penultimate and from 10-16 on the body whorl, ribs becoming occasionally shorter prior to reaching the back of the outer lip; spiral sculpture consists of finely incised spiral striae which number from 6-9 on the penultimate and from 6-11 on the body whorl, base of last whorl with 3 spiral cords and 4-5 oblique cords on the siphonal fasciole, subsutural groove slightly deeper and giving rise to a row of sutural nodules. Aperture very short, narrow, outer lip thick and variced, interior with 5-6 small denticles, columella narrowly-calloused and with a basal fold and 2-4 small denticles, siphonal notch deep, anal canal distinct and with a short narrow channel intruding on to the back of the outer lip. Brown in colour, ornamented with narrow white spiral bands, or light steel-grey, ornamented with 2 interrupted brown bands on spire whorls and 3 bands on body whorl, some bands occasionally with a bluish cast, siphonal fasciole whitish, aperture white and narrowly brown-banded, edge of columellar callus and outer lip stained with chocolate-brown. Albinotic specimens have been seen from Papua New Guinea. Operculum orange-brown and minutely serrate at margin.

TYPE LOCALITY. Malacca, Malaysia, 18 m *(labiatus)*; none (*costata* A.Adams, 1853 and *terebroides*).

DISTRIBUTION. From Malaysia to the Fiji Is. Intertidal and subtidal.

Type specimens. Three syntypes of *N.labiatus* (A.Adams) are in the British Museum (N.H.), London, No.197345, and the syntype measuring length 14.2 mm, width 5.0 mm, is here selected as the lectotype (pl.41, fig.11). The holotype of *Nassa costata* A.Adams, 1853 (also the type of *N.terebroides* Reeve), is in the same Institution, No.197360, length 15.1 mm, width 5.4 mm.

Material examined. MALAYSIA: Malacca (BMNH); INDONESIA: Bali (AMS); PAPUA NEW GUINEA: Madang (coll.Hoeter); NEW HEBRIDES: Malapoa Pt., Vila Harbour, Efate I (coll.Eker); Forari, Efate I (coll.Bratcher); FIJI IS: Manava I, N. of Viti Levu (coll.Eker); Yasawa Is (coll.Parkinson).

Nassarius (Aciculina) teretiusculus (A.Adams, 1852)
(Plate 41, fig.14; plate 42, figs.1-3)

1852. *Nassa teretiuscula* A.Adams, Proc.Zool.Soc.Lond. Pt.19:108; 1853 Reeve, Conch.Iconica 8:pl.16, figs.104a,b.
1939. *Nassarius (Tritia) celebensis mantjeuriensis* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):172, pl.15,figs.269a,b; 270.
1942. *Zeuxis teretiuscula* (A.Adams), Yen, Proc.Malac.Soc.Lond. 24:233, pl.23, fig.166 (figd.syntype).

Shell up to 14.0 mm in length, elongate-ovate, spire acuminate, constricted at base, smooth and shining, teleoconch of 5-6 convex whorls, protoconch of 2¾-3 smooth, glassy embryonic whorls; sculptured with regular, angulate axial ribs which become obsolete on the dorsal side where they are indicated only as sutural nodes; a spiral sculpture is absent, with the exception of 2-3 nodulose cords at base of body whorl and 6-7 strong oblique cords on the siphonal fasciole, axial ribs slightly constricted anterior to sutures rendering axial ribs weakly nodose at this point. Aperture short and narrow, outer lip thick and prominently variced, interior with minute denticles, columella narrowly calloused, anterior part descending almost vertically and with a basal fold and 3-4 short lirae, siphonal notch prominent, bounded by an elongate denticle on anterior edge of outer lip, anal canal distinct. Variable in colour, either purple-brown, with a darker purple band on body whorl and axial ribs at sutures and siphonal canal white, or cream to pale yellow in colour, ornamented with a purplish-brown sutural band on spire whorls and suture of body whorl, a central spiral line of the same colour on body whorl

and a basal band which becomes broader and more saturated on the dorsal side, aperture cream, lined with purple-brown, siphonal fasciole and varix white. Operculum translucent yellowish-brown and minutely serrate at the margin.

TYPE LOCALITY. Eastern Seas *(teretiusculus)*; Tjiletoeh, Sth. Bantam, Java, Pliocene of Indonesia *(mantjeuriensis)*. Hong Kong is here designated as the type locality (specimens in AMS and Auckland University).

DISTRIBUTION. From Thailand to Indonesia and China. Intertidal and subtidal.

Type specimens. Three immature syntypes of *N.teretiusculus* (A.Adams) are in the British Museum (N.H.), London, No.1973180, and the specimen measuring length 13.3 mm, width 6.3 mm, is here selected as the lectotype (pl.41, fig.14).

The type specimen of *N.mantjeuriensis* Oostingh, is presumably in the Museum of Bandoeng, Indonesia, length 8.8 mm, width 4.8 mm.

Material examined. THAILAND: Hua Hin (USNM); MALAYSIA: Singapore (coll.Marrow); Sirangoon, Malacca (coll.Jensen); INDONESIA: Domaring, Borneo; Berhala Channel, Nth. Borneo (both USNM); Labuan (AMS); Telok Beloh, Sarawak, Borneo (coll.Richardson); CHINA: Tai Tan Harbour, Hong Kong I (Auckland Univ.); Shiu Hau Bay, Lantow I, Hong Kong (AMS).

Fossil record. PLIOCENE: Tjiletoeh, Sth. Bantam, Java (type locality of *mantjeuriensis* Oostingh).

Nassarius (Aciculina) nobilis (Thiele, 1925)
(Plate 42, figs.4-6)

1925. *Nassa nobilis* Thiele, Wiss.Ergeb.deut.Tief.-Exped."Valdivia" 17:331, pl.32, (20), fig.16.
1933. *Nassarius (Alectrion) insulindicus* Oostingh, De Mijningenieur 14:194, textfig.3.
1939. *Nassarius (Tritia) insulindicus* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):174, pl.15, figs.271,272,a,b,274; 1945 Altena & Beets, Verh.Geol.Mijnb.Genoot.Ned.Kolon., Geol. 14:42.
1939. *Nassarius bodjongensis* Oostingh, Ned.-Indie Natuurw.Congress p.510 (nomen nudum).
1939. *Nassarius (Tritia) insulindicus* forma *bodjongensis* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):174, pl.15,fig.273.

Shell up to 12.0 mm in length, elongate-ovate, spire acuminate, teleoconch of 6-6½ straight whorls which are concave anterior to sutures and angulate on presutural ramp, protoconch of 2½-3 smooth embryonic whorls; sculptured with angulate axial ribs which continue to the body whorl and number from 9-10 on the penultimate and from 9-13 on the body whorl; spiral sculpture sometimes obsolete or consisting of 2-3 macroscopically punctate spiral striae on the penultimate and from 2-4 striae on body whorl and 3-4 nodulose basal cords, siphonal fasciole with 5-6 oblique cords, sutures adpressed and ornamented with small round nodules, axial ribs on presutural ramp also nodose, siphonal notch distinct, anal canal with a narrow channel. Aperture small, shorter than the spire, outer lip thickened and variced, interior with 5-7 denticles, columella with a slightly spreading callus which is thicker anteriorly and thinner posteriorly and spreading almost to the presutural ramp, columella with a basal fold and 3-4 small denticles, parietal fold distinct. Transparent white in colour, body whorl with 1-2 blackish-brown bands.

TYPE LOCALITY. Padang, Sumatra, Indonesia.

DISTRIBUTION. Known only from Indonesia.

Type specimens. The holotype of *N.nobilis* (Thiele), is in the Zoological Museum, Humboldt University, Berlin, length 7.6 mm, width 3.7 mm. The holotype of *N.insulindicus* Oostingh, length 12.0 mm, width 5.0 mm, and the illustrated juvenile type of *N.bodjongensis* Oostingh, length 7.6 mm, are presumably in the Museum of Bandoeng, Indonesia.

Apart from the type, no specimens of *N.nobilis* have been seen in any Museums or private collections.

Nassarius (Aciculina) sumatranus (Thiele, 1925)
(Plate 42, figs.8,9)

1925. *Nassa sumatrana* Thiele, Wiss.Ergeb.deut.Tief.-Exped."Valdivia" 17:296, pl.20,fig.15.

Shell up to 9.0 mm in length, elongate-ovate, spire acuminate, solid, teleoconch of 3¾-4½ convex whorls, protoconch of 4¼ glassy, finely carinate embryonic whorls; sculptured with very angulate axial ribs which continue to the back of the outer lip and number from 13-20 on the penultimate and from 8-10 on the body whorl, last 2-3 ribs on body whorl frequently obsolete; spiral sculpture consists of finely incised, macroscopically punctate spiral striae which number from 4-5 on the penultimate and from 5-10 on the body whorl, base of shell with 3-4 nodulose cords, siphonal fasciole with 6-7 close-set oblique cords, siphonal notch deep, anal canal distinct; a moderately deep subsutural

groove produces prominent sutural nodules. Aperture small, shorter than the spire, outer lip thickened and prominently variced, interior with 4-6 small denticles, columella calloused, anterior half of callus prominent, laminate, and almost descending vertically, and with 1 basal fold and 4-5 small denticles, area above parietal wall thinning, highly glazed and sometimes almost touching sutural nodules, area above anal canal with a callus-knob. White to creamy-yellow in colour, spire whorls with 2 and body whorl with 3 purplish-brown spiral bands, varix whitish and with 2 brown blotches anteriorly, columellar callus bluish-white, with a dark parietal blotch under glaze, aperture white and brown-banded. Operculum orange-brown and minutely serrate at the margin.

TYPE LOCALITY. Padang, Sumatra, Indonesia.

DISTRIBUTION. Known to date from Indonesia and the Philippines. Habitat unknown.

Type specimens. The holotype of *N.sumatranus* (Thiele), is in the Zoological Museum, Humboldt University, Berlin, length 6.8 mm, width 3.5 mm. Four paratypes are in the British Museum (N.H.), London.

Material examined. INDONESIA: Padang, Sumatra (BMNH); PHILIPPINES: Mindoro I, (coll.Norton).

The species must be rather rare since only 6 specimens have been seen.

Nassarius (Aciculina) fennemai Oostingh, 1939
(Plate 42, fig.7)

1939. *Nassarius (Tritia) fennemai* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):172, pl.15,fig.268.

"A small, conically-ovate shell, with a moderately shining appearance. Spire very high, post-embryonic whorls separated by shallow sutures; whorls with 14-16 axial ribs, interspaces as broad as ribs, a moderately shallow subsutural groove bisects ribs and forms a row of flattish nodules. Interspaces of ribs almost smooth with growth-striae visible under magnification, base of shell with 3 narrow spiral cords and 4 spiral grooves, two anterior cords nodulose, siphonal fasciole with oblique cords. Siphonal canal short, outer lip thickened and with a smooth, broad varix, interior with 7 short denticles, third posterior tooth larger than others. Columella weakly concave, almost vertical, callus somewhat spreading but not well bordered, columella with a parietal fold and 4 denticles and some small wrinkles, siphonal notch moderately deep.

The only known specimen has part of the apex missing and consists of only 3¼ whorls. Some colour still remains in the form of a light yellowish zone posteriorly on whorls, and a darker coloured band is also present at the base of body whorl." (Abridged translation).

TYPE LOCALITY. Tjidilem, Sth. Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The incomplete holotype of *N.fennemai* Oostingh, length 6.0+ mm, width 3.4 mm, is presumably in the Museum of Bandoeng, Indonesia.

Nassarius (Aciculina) moestus (Hinds, 1844)
(Plate 42, figs.10-14)

1844. *Nassa moesta* Hinds, Zool.Voy.H.M.S."Sulphur", Moll.Pt.2:36, pl.9, figs.18,19; 1876 E.A.Smith, J.Linn.Soc.Lond. 12:546.
1873. *? Nassa anthracina* Garrett, Proc.Acad.Nat.Sci.Philadelphia Pt.2:229, pl.3,fig.57.
1882. *Nassa (Zeuxis) moesta* Hinds, Tryon, Man.Conch. 4:33, pl.10,fig.101.
1908. *Nassa tristis* Preston, Rec.Indian Mus.Calcutta 2(2):194, pl.14,fig.9.
1975. *Nassarius moestus* (Hinds), Cernohorsky, Rec.Auckland Inst.Mus.12:139, figs.39-41.

Shell up to 10.0 mm in length, broadly elongate-ovate, solid, spire acuminate, teleoconch of 4½-6 convex whorls, protoconch of 3¼-3½ glassy, golden-brown, banded embryonic whorls with only the last ¼ turn finely carinate; sculptured with weak, low and irregular, slender axial ribs which may become obsolete on last whorl; ribs when present, number from 16-21 on the penultimate and from 15-17 on the body whorl; spiral sculpture consists of overriding spiral threads which form narrow, laterally elongate nodules upon ribs, main cords number from 4-7 on the penultimate and from 12-15 on body whorl, interspaces between main spiral threads with an additional sculpture of numerous, very fine spiral striae, siphonal fasciole with 5-6 oblique cords, area anterior to sutures concave and separating well-defined sutural nodules. Aperture narrow, shorter than the spire, outer lip thick and prominently variced, interior with 5-6 strong denticles, second denticle anterior to anal canal usually larger than the first, columella with a spreading, circular callus, area above parietal wall slightly thinner, columella with a basal fold and from 1-3 adjoining denticles, siphonal canal narrow and oblique, anal canal prominent. Brown, greenish-brown to purple-brown in colour, sutural nodules paler, body whorl with a yellowish-white subsutural band, aperture purplish-brown, columellar callus orange-brown to chocolate-brown.

TYPE LOCALITY. Gulf of Papagayo, W. coast of central America = error! *(moestus)*; Viti Isles [= Fiji Is] *(anthracina)*; Andaman Is *(tristis)*; San Christoval, Solomon Is, is here designated as the type locality.

DISTRIBUTION. From the Andaman Is to the Philippines and the Fiji Is. Intertidal, on reefs.

Type specimens. Two syntypes of *N.moestus* (Hinds), are in the British Museum (N.H.), London, No.1844.9.23.3-4, and the specimen measuring length 9.5 mm, width 4.7 mm, is here selected as the lectotype (pl.42, fig.10). The very worn holotype of *Nassa anthracina* Garrett, is in the Academy of Natural Sciences, Philadelphia, No.16261, length 6.7 mm, width 3.0 mm, and the holotype of *N.tristis* Preston, is in the Zoological Survey of India, No.M-4013/1, length 10.1 mm, width 4.5 mm.

Material examined. ANDAMAN IS: (ZSI); PHILIPPINES: Estero, Sablayan Bay, Mindoro (USNM); PAPUA NEW GUINEA: Milne Bay (AMS); Rabaul, New Britain (coll.Parkinson); SOLOMON IS: San Christoval (BMNH); NEW HEBRIDES: East of Ne'afou village, Espiritu Santo (coll.Willan); Lolowai, Aoba I (coll.Gardner).

Cernohorsky (1975a) discussed the taxonomy of *N.moestus* at length. It was pointed out that Hinds (1844) described *N.moestus* from the west coast of Central America on the authority of the notoriously unreliable Capt.Belcher. E.A.Smith (1876) was the first author to cast doubt on the reliability of the west American locality when he stated "There is another remarkable instance of wide geographical distribution, supposing both the above localities [Gulf of Papagaya and San Christoval, Solomon Is] to be correct. Of the identity of this specimen from the Solomon Islands with examples from central America there is not a shadow of doubt. It has been compared with typical examples of *moesta* received from Sir Edward Belcher and labelled in Hinds's handwriting, and in no respect differs from them." This is followed by a detailed description of the true *N.moestus*. Tryon (1882) erroneously synonymised *N.moestus* with *N.exilis* and gave the localities of Fiji Is and Solomon Is on the authority of A.Garrett and J.Brazier, who personally collected the species *[N.moestus]* at these places. Subsequent authors acknowledged *N.moestus* as of West American origin, but applied the taxon to a species of quite different appearance. It has been confused with the West American species subsequently described as *Nassa brunneostoma* Stearns, 1893, from the Gulf of California and *N.leucops* Pilsbry & Lowe, 1932, from Kino Bay, Sonora, Mexico, and *Nassarius brunneostomus* (Stearns, 1893) is the taxon applicable to the West American species.

The type specimen of *Nassa anthracina* Garrett, is extremely worn and thus appears smooth, but under magnification undulations of former axial ribs can still be seen.

Nassarius (Aciculina) pupinoides (Reeve, 1853)
(Plate 43, figs.1-4)

1853. *Nassa (Aciculina) striata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:114; 1934 Mari, J.Conchyl. 78:51 (non C.B.Adams, 1852).
1853. *Nassa pupinoides* Reeve, Conch.Icon. 8:pl.24,figs.162,162a (nom.subst.pro *N.striata* A.Adams, 1853); 1876 E.A.Smith, J.Linn.Soc.Lond. 12:546; 1932 Tomlin, Proc.Malac.Soc.Lond. 20:96.
1901. *Nassa cebuensis* Sowerby, Proc.Malac.Soc.Lond. 4:208, pl.22,fig.2.
1934. *Nassa striata* var. *cebuensis* Sowerby, Mari, J.Conchyl. 78:51.

Shell up to 11.0 mm in length, elongate-ovate and somewhat pupiform, teleoconch of 5-5½ convex whorls, protoconch incomplete in specimens examined; axial sculpture almost obsolete, and when present, consists of irregular and very weak low axial folds which are often only indicated as axial riblets at the sutures; spiral sculpture prominent and consisting of numerous, fine encircling spiral threads, some larger than others, and numbering up to 22 on the penultimate and up to 33 on the body whorl, siphonal fasciole with 1 strong cord and 6-7 finer cords. Aperture small, shorter than the spire, thickened and variced, interior with 8-11 equal-sized denticles, last anterior denticle bordering siphonal canal prominent, columella calloused and broader anteriorly, smooth apart from 1 basal fold and 1 denticle, parietal denticle moderately weak, siphonal notch deep anal canal prominent. White, fawn to yellowish-brown, ornamented with brown to lilac bands, 1-3 on body whorl, some individuals dark brown in colour and with a paler subsutural band and one interrupted dark band at sutures, columellar callus pale fawn to chocolate-brown, aperture brown.

TYPE LOCALITY. St.Nicholas, Zebu I [= Cebu I], Philippines, 9 m (*pupinoides* and *striata* A.Adams); Cebu I, Philippines *(cebuensis)*.

DISTRIBUTION. From Indonesia to the Philippines. Also reported from the Solomon Is by E.A.Smith (1876). On reefs, intertidal and subtidal.

Type specimens. The following type-specimens are in the British Museum (N.H.), London: two syntypes of *Nassa striata* A.Adams (which are also the types of *N.pupinoides* Reeve), No.197354, and

the syntype measuring length 10.5 mm, width 5.3 mm, is here selected as the lectotype (pl.43, fig.1); two Reeve specimens of *N.pupinoides* (no number), which qualify as paralectotypes; and three syntypes of *Nassa cebuensis* Sowerby, No.1901.10.3.26-28, and the specimen measuring length 12.7 mm, width 6.0 mm, is here designated as the lectotype (pl.43, fig.2).

Material examined. INDONESIA: Kupang, Timor (coll.McCausland); PHILIPPINES: W. of Tara I; Opol; Guijulugan (all USNM); Mactan I (coll.Norton).

The species is similar to *N.moestus* (Hinds), and differs in being usually more slender with only an obsolete axial sculpture, lacking nodules, and having considerably more numerous spiral striae and more numerous, smaller and equal-sized denticles on the outer lip.

Nassarius (Aciculina) ischnus (Melvill, 1899)
(Plate 43, fig.5)

1899. *Nassa (Hima) ischna* Melvill, Ann.Mag.Nat.Hist. (7), 4:84, pl.1,fig.1; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:414.
1928. *Nassarius (Hima) ischnus* var. *brunneofasciata* Melvill, Proc.Malac.Soc.Lond. 18:107.

Shell up to 10.0 mm in length, fusiformly-elongate, spire tall and slender, teleoconch of 6½-6¾ convex whorls which are subangulate on presutural ramp, protoconch of 3¼ smooth, embryonic whorls; sculptured with irregular, slender axial ribs which continue to the back of the outer lip and number from 13-15 on the penultimate and 14 on the body whorl; spiral sculpture consists of overriding spiral cords which render axial ribs nodulose and which number 3 on the penultimate and 7 on the body whorl, siphonal fasciole with 5-6 oblique cords. Aperture narrow and very short, outer lip thick and prominently variced, interior with 6-7 denticles, columella weakly and narrowly callused and with 2-3 small denticles, siphonal notch and anal canal prominent. White in colour, banded with reddish-brown, aperture white.

TYPE LOCALITY. Near Muscat, Gulf of Oman *(ischnus)*; Pasni and Gwadur, Persian Gulf, 73 m *(brunneofasciata)*.

DISTRIBUTION. From the Persian Gulf to Pakistan. Subtidal, to a depth of 73 m.

Type specimens. Two syntypes of *N.ischnus* (Melvill), are in the British Museum (N.H.), London, No.1899.12.18.40-41, and the specimen measuring length 9.7 mm, width 4.0 mm, is here selected as the lectotype (pl.43, fig.5). The location of the type-specimen of the var.*brunneofasciata* Melvill, is not known to me.

Material examined. GULF OF OMAN: near Muscat (BMNH); PAKISTAN: Karachi (coll.Powell).

This appears to be a rare species and only half a dozen specimens have been examined.

Subgenus **Pygmaeonassa** Annandale, 1924

Pygmaeonassa Annandale, Mem.Indian Mus.Calcutta 5(12):855, 868. Type species by OD *Nassa orissaensis* Preston, 1914. Recent, brackish water, Indian coast.

"The shell is small and comparatively fragile but strongly sculptured with vertical ribs, of a narrowly ovate form. The mouth is large, narrowly ovate and a little contracted above; the outer lip is sharp but thickened within, the columella devoid of folds but sometimes with a slightly developed tubercle. The callus is narrow and confined to the columellar margin.

The animal has a comparatively long and narrow foot with parallel sides and not expanded anteriorly. Its antero-lateral angles are produced into short filaments and its posterior extremity is truncate or broadly rounded with a slight excavation. The siphon is as long or nearly as long as the shell. The anterior margin of the head is broadly truncate; the tentacles are comparatively short and slender and have the eyes situated on their external surface at some distance from their base. The operculum is thin, horny and paucispiral resembling that of many Rissoidae and Melaniidae. It is relatively large.

The radula is normal, but the number of denticulations on the central is relatively small and the lateral projections of its base feebly developed. The laterals resemble those of *Nassa* [= *Nassarius*].

The peculiarities of the shell, operculum and radula and especially those of the operculum seem to me amply sufficient for the separation of the two small Chilka species [i.e. *N.orissaensis* Preston and *N.subconstrictus* Sowerby] from the genus *Nassa* [= *Nassarius*]." (Original description).

GEOGRAPHICAL DISTRIBUTION. Brackish water of the Indian coasts.

STRATIGRAPHICAL RANGE. Recent.

The shell, animal and radula of *Pygmaeonassa* species is not generically different to other species of *Nassarius*, and a subgeneric classification is proposed on the basis of the more laterally placed nucleus of the operculum in *Pygmaeonassa* and its brackish water habitat.

The subgenus contains only 3 living species, all confined to the coast of India.

Nassarius (Pygmaeonassa) orissaensis (Preston, 1914)
(Plate 43, figs.6-9)

1914. *Nassa orissaensis* Preston, Rec.Indian Mus.Calcutta 10:299, textfigs. 10,10a; 1915 Preston, Rec.Indian Mus.Calcutta 11:290; 1919 Annandale & Prashad, Rec.Indian Mus.Calcutta 16:253, textfig.6a (radula).
1915. *Nassa orissaensis* var. *ennurensis* Preston, Rec.Indian Mus.Calcutta 11:479 (nomen nudum).
1916. *Nassa orissaensis* var. *ennurensis* Preston, Rec.Indian Mus.Calcutta 12:28, textfigs. 2,2a.
1919. *Nassa ennurensis* Preston, Annandale & Prashad, Rec.Indian Mus.Calcutta 16:253.
1919. *Nassa ennuresnsis* var. *depauperata* Annandale & Prashad, Rec.Indian Mus.Calcutta 16:253, pl.20, fig.9 (shell), textfig.6c (radula).
1924. *Pygmaeonassa orissaensis* (Preston), Annandale, Mem.Indian Mus.Calcutta 5(12):855, 868, textfig.11 (operculum).

Shell up to 11.0 mm in length, elongate-ovate, teleoconch of 4½-5¼ whorls which are subangulate on the presutural ramp, protoconch of 1¼-1½ smooth, globose embryonic whorls with the last half turn macroscopically axially striate; sculptured with irregular, slender axial riblets which continue to the back of the outer lip and number from 14-16 on the penultimate and from 17-21 on the body whorl, some axial ribs occasionally doubled; spiral sculpture consists of fine spiral threads which number from 3-6 on the penultimate and from 3-10 on the body whorl, some individuals with obsolete spiral sculpture and with only the lower half spirally corded, presutural ramp of whorls usually with small echinate nodules, siphonal fasciole with a prominent spiral cord. Aperture narrow, only weakly variced, interior with 7-10 weakly developed lirate denticles, columella only narrowly calloused and smooth apart from a weakly developed parietal denticle, a basal fold and occasionally another small denticle, siphonal notch and anal canal prominent. White to straw-yellow in colour, aperture bluish-white, some individuals with a narrow dark band on body whorl. Operculum brown, margins simple.

TYPE LOCALITY. Lake Chilka, Orissa, 5 km off Balugaon, east coast of India, 2-3 m *(orissaensis)*; Ennur backwater, Madras, India *(ennurensis)*; Kaikal Maree, near Port Canning, Gangetic Delta, India, 7-11 m *(depauperata)*.

DISTRIBUTION. Known only from India. In lakes and creeks of brackish water, on a muddy bottom, to a depth of 18 m.

Type specimens. The holotype of *N.orissaensis* var. *ennurensis* Preston, is in the Zoological Survey of India, Calcutta, No.10072/2, length 10.3 mm, width 4.9 mm. The holotype of the var. *depauperata* Annandale & Prashad, is in the same Institution, No.11488/2, length 5.8 mm, width 2.9 mm. The type of *N.orissaensis* (Preston) has not been found.

Material examined. INDIA: Sand Heads and Port Canning, W. Bengal; Ennur backwater, Madras (both ZSI).

Literature Records. INDIA: Channel off Barhampur I, 2-3 m; 1.6 km N.E. of Chiriya I, 2 m; opposite Barkul bungalow; 3-13 km N.E. of Kalidais, 2 m; S.E. of Barkuda and Samal I, 2 m; Serua Nadi, 2-3 m; Channel between Barnikuda and Satpara, 2 m; about 7 km E.N.E. off Kalupara Ghat; 1.6-2.0 km of Kalupara Ghat (all Preston 1915); canal near Chingrighatta, outskirts of Calcutta (Preston 1916a).

The form *depauperata* has been based on small shells with a more prominent spiral sculpture.

Nassarius (Pygmaeonassa) fossae (Preston, 1915)
(Plate 43, fig.10)

1915. *Nassa fossae* Preston, Rec.Indian Mus. Calcutta 11:479, textfigs.1,1a.

"Shell allied to *N.orissaensis* Preston, but differing from that species in its larger size as compared with the type and both larger size and much boarder form as compared with the above variety *[ennurensis]*; the subperipheral band is of a whitish colour and the spiral lirae are considerably coarser and very much more numerous, the aperture is much broader and the columella margin is distinctly curved; it is 6 whorled." (Original description).

TYPE LOCALITY. Canal near Chingrighatta, outskirts of Calcutta, India.

DISTRIBUTION. Known only from India. Habitat unknown.

Type specimens. The type specimen of *N.fossae* (Preston) has not been located. The original dimensions were length 9.5 mm, width 5.5 mm.

No specimens have been seen of this species. The type-figure shows a shell which is regularly convex, lacking the subangulate presutural ramp of *N.orissaensis*, and also has a more prominent, encircling spiral sculpture and broader aperture. Research workers with access to material of *Pygmaeonassa* species may confirm or reject the validity of *N.fossae*.

Nassarius (Pygmaeonassa) subconstrictus (Sowerby, 1899)
(Plate 43, figs.11-15)

1899. *Nassa subconstricta* Sowerby, Proc.Malac.Soc.Lond. 3:301, textfigs.
1904. *Nassa (Phrontis) gangetica* Preston, J.Malac. 11:76, pl.6,figs.5,6.
1914. *Nassa denegabilis* Preston, Rec.Indian Mus.Calcutta 10:297, textfig.9; 1915 Preston, Rec.Indian Mus.Calcutta 11:290; 1915 Preston, Rec.Indian Mus.Calcutta 11:479; 1916 Preston, Rec.Indian Mus.Calcutta 12:28; 1919 Annandale & Prashad, Rec.Indian Mus.Calcutta 16:253, textfig.6b (radula).

Shell up to 11.0 mm in length, elongate-ovate, some specimens broader than others, teleoconch of 5-5½ convex whorls, protoconch of 2¼-2½ smooth embryonic whorls; sculptured with prominent, almost varicose axial ribs which become obsolete on the dorsal side of body whorl and number from 10-12 on the penultimate and from 4-7 on the body whorl; spiral sculpture obsolete, penultimate whorls smooth or with up to 3 very faint spirals, lower half of body whorl with 6-10 spiral threads, siphonal fasciole with 4-5 oblique cords, first 2 post-embryonic whorls subangulate and with 2 overriding spiral cords. Aperture small, shorter than the spire, outer lip thick and strongly variced, interior with 5-7 denticles, columella narrowly calloused and usually with only a single basal fold, siphonal notch and anal canal distinct. Straw-yellow to tan in colour, some individuals creamy-white and brown-banded, aperture porcellaneous-white. Operculum brown, margins simple.

TYPE LOCALITY. Port Canning, mouth of the Ganges, India *(subconstrictus)*; Calcutta, India *(gangetica)*; Lake Chilka, along marine side of Lake Estuary, east coast of India *(denegabilis)*.

DISTRIBUTION. Known only from India. Frequently in shallow, brackish water, to a depth of 6 m.

Type specimens. The holotype of *Nassa gangetica* Preston, is in the British Museum (N.H.), London, No.1905.2.8.11, length 10.7 mm, width 4.2 mm. The type-specimens of *Nassarius subconstrictus* (Sowerby), and *Nassa denegabilis* Preston, have not been found.

Material examined. INDIA: Port Canning (BMNH; USNM); Chilka, Orissa; Puri (both ZSI).

Literature records. INDIA: Channel between Satpara and Barhampur, 2-6 m; Nalbano and channel S.E. of Nalbano, 1-2 m; sand-dunes opposite Manikpatna; Seru Nadi, 3-4 m; canal near Chingrighatta, outskirts of Calcutta (all Preston 1915); Ennur backwater, Madras; Cochin backwater near Ernakulam (both Preston 1916a).

Subgenus **Nassodonta** H.Adams, 1867

Nassodonta H.Adams, 1867, Proc.Zool.Soc.Lond. p.445. Type-species by M *N.insignis* H.Adams, 1867. Recent, brackish water, coasts of India.

Shell up to 12.0 mm in length, ovate and solid, teleoconch very short and consisting of only 3-3½ convex whorls. Smooth apart from longitudinal growth-striae and a very heavy cord at the base. Outer lip only weakly variced, denticulate within, columella with a moderately broad callus and a basal fold.

Radula and operculum unknown.

GEOGRAPHICAL DISTRIBUTION. Brackish water of the Indian coast.

STRATIGRAPHICAL RANGE. Recent.

The genus-group remains monotypic. For further discussion see under the description of the type-species.

Nassarius (Nassodonta) insignis (H.Adams, 1867)
(Figs. 156,157)

1867. *Nassodonta insignis* H.Adams, Proc.Zool.Soc.Lond. p.445, pl.38,fig.8; 1895 E.A.Smith, Proc.Malac. Soc.Lond. 1:257; 1916 Preston, Rec.Indian Mus.Calcutta 12:28; 1942 Yen, Proc.Malac.Soc.Lond. 24:231, pl.23,fig.163 (figd.holotype).
1916 *Nassodonta gravelyi* Preston, Rec.Indian Mus.Calcutta 12:29, textfig.3.

Shell up to 12.0 mm in length, ovate and solid, some specimens broader than others, teleoconch of only 3-3½ convex whorls, protoconch of 1½ embryonic whorls which are partly macroscopically axially striate; shell smooth except for very fine axial growth-striae and 1 heavy, flattish spiral cord at base of body whorl. Aperture moderately narrow, outer lip thickened but not strongly variced, interior with 4-5 denticles which decrease in size anteriorly, columella concave and with a moderately broad and thick callus, base of columella with a fold and occasionally another weak plication, siphonal notch deep and broad, parietal denticle swollen, anal canal distinct. Fawn to brown in colour, ornamented with a moderately broad, interrupted brown sutural band on body whorl, and another narrower interrupted central band and a continuous basal band; some individuals are brown, with a broad dark brown band on posterior half of body whorl, aperture white but sometimes stained with brown.

TYPE LOCALITY. Peiho river, China = ? error *(insignis)*; Cochin backwater near Ernakulam, India *(gravelyi)*.

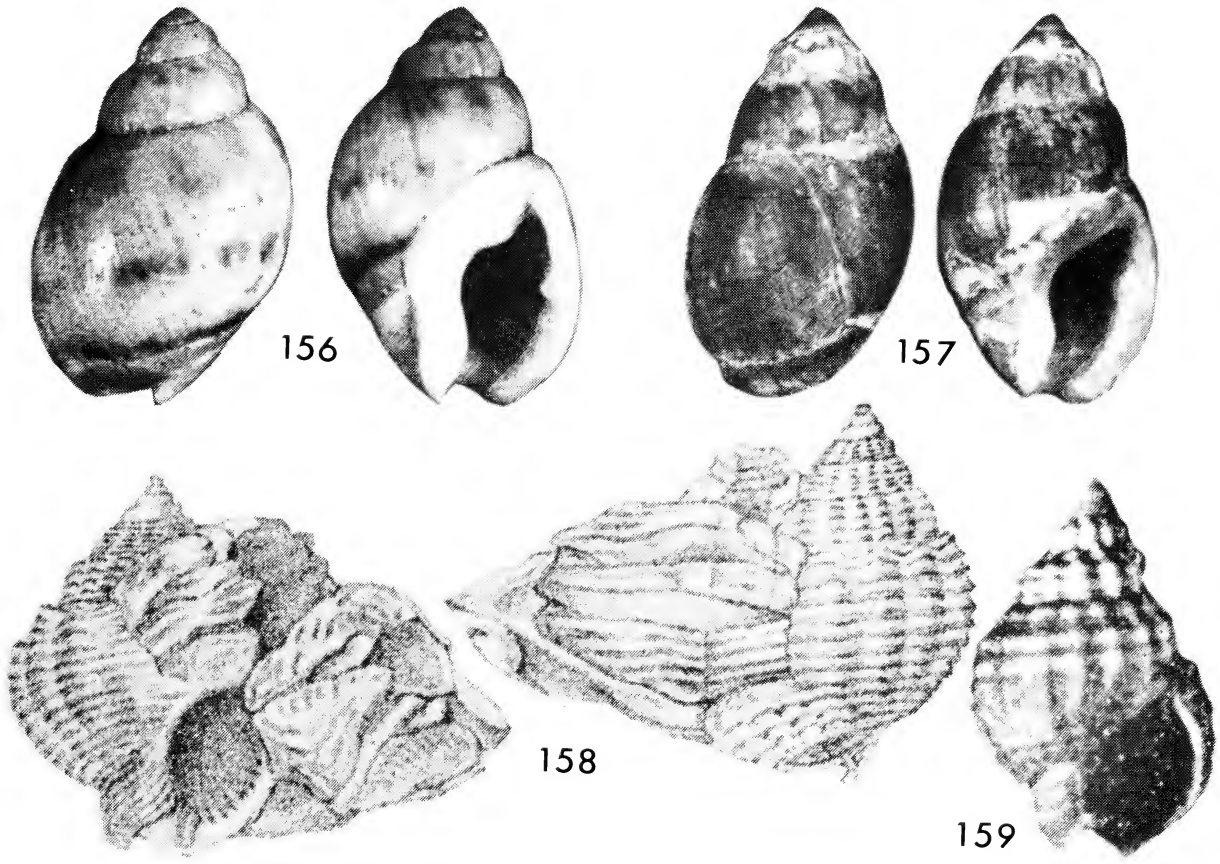
DISTRIBUTION. Apparently confined to the coasts of India. In shallow, brackish water.

Type specimens. The holotype of *N.insignis* (H.Adams), is in the British Museum (N.H.), London, No.1878.1.28.428, length 10.0 mm, width 6.6 mm. The holotype of *Nassodonta gravelyi* Preston, is in the Zoological Survey of India, Calcutta, No. M-10055/2, length 7.4 mm, width 4.2 mm.

Material examined. INDIA: Conchin backwater near Ernakulam; Ennur backwater, Madras (both ZSI).

E.A.Smith (1895b) correctly transferred the species from the Buccinidae to the Nassariidae and pointed out that it hardly differed from some other known genera of Nassariidae. He also discussed the original locality indication of "Peiho river, China", and stated that on the label accompanying the type is written "Peihoi, fresh water, Calvert, with *Velorita*". Smith further points out that the genus *Velorita* occurs only on the west side of the Indian Peninsula, in the neighbourhood of Cochin, and in the estuary of the river Kundapur, where it is largely eaten by natives, and that it has never been found in China, and that "Peihoi" could be some small village on the Malabar coast.

The occurence of *N.insignis* in India has been subsequently confirmed through the collection of specimens from Cochin, and the description of *N.gravelyi* from Cochin and Madras. The occurence of the species in China or the intervening areas between India and China, has never been established.



Figs. 156-159. 156,157. *Nassarius (Nassodonta) insignis* (H.Adams). 156. Holotype BM(NH) No.1878.1.28.428; 10.0 mm. 157. Holotype of *Nassodonta gravelyi* Preston, ZSI No.M-10055/2; 7.4 mm. 158. *"Hebra" junghuhni* (K.Martin). Type-figure (from K.Martin, 1895, pl.17,fig.234). 159. *"Hebra" kondangensis* (Oostingh). Type-figure; 5.5 mm. Juvenile specimen (from Oostingh, 1939, pl.16,fig.289).

Genus **Hebra** H. & A.Adams, 1853

Hebra H. & A.Adams, 1853, Gen.Rec.Moll. 1:120. Type species by SD (Cossman, 1901) *Buccinum muricatum* Quoy & Gaimard, 1833 [non Schroeter, 1805] = *B.horridum* Dunker, 1847. Recent, Indo-Pacific.

1939. *Scabronassa* Peile, Proc.Malac.Soc.Lond. 23:276. Type species by OD *Buccinum horridum* Dunker, 1847.

Shell small, up to 20.0 mm in length but usually smaller, squat and ovate; sculpture spinose, spiral cords usually prominent, spire short, whorls angulate; aperture small and ovate, columellar callus generally partly spreading on to body whorl, columella plicate or prominently wrinkled, siphonal canal short.

Radula differs from other Nassariidae in the following features: rachidians very low and bow-shaped; laterals complicated in structure, being humped and having squared cusps reminiscent of some species of Columbellidae (Figs. 43-45).

GEOGRAPHICAL DISTRIBUTION. Tropical Indo-Pacific.

STRATIGRAPHICAL RANGE. Probably Recent only. The records of *N.kondangensis* Oostingh, based on a juvenile specimen from the Indonesian Pliocene, and *N.junghuhni* (K.Martin), from unknown age of Java, need to be confirmed as definite members of the *Hebra* group.

The group contains 4 Recent and 2 questionable fossil *Hebra* species. Recent species live on reef-flats on a hard coral substrate or in lagoons, sandpockets of reefs and among mangroves.

Hebra horrida (Dunker, 1847)
(Plate 44, figs.1-4)

1833. *Buccinum muricatum* Quoy & Gaimard, Voy.l'Astrolabe,Zool. 2:450, pl.32, figs.32,33; 1834 Kiener, Spec.gen.icon.coq.viv. 9:93, pl.27, fig.110 (non Schroeter, 1805).
1846. *Buccinum scabrum* Dunker, Zeit.f.Malakozool. 3:171 (non Anton, 1838).
1847. *Buccinum horridum* Dunker, Zeit.f.Malakozool. 4:59, 1849 Philippi, Abb.Beschr.Conchyl. 3:66, pl.2,fig.8 (nom.subst.pro *B.scabrum* Dunker, 1846).
1850. *Nassa curta* Gould, Proc.Boston Soc.Nat.Hist. 3:153; 1852 Gould, U.S.Expl.Exped. 12:258, pl.19,figs.326a-c; 1876 E.A.Smith, J.Linn.Soc.Lond. 12:544.
1853. *Nassa muricata* Q. & G., Reeve, Conch.Icon. 8:pl.11, figs.73a,b; 1864 Crosse & Fischer, J.Conchyl. 12:333; 1887 v.Martens, J.Linn.Soc.Lond. 21:181; 1908 Hirase, Conch.Mag.Kyoto 2:pl.29, figs.90,91; 1934 Mari, J.Conchyl. 78:58.
1853. *Nassa horrida* Dunker, Reeve, Conch.Icon. 8:pl.11,figs.69a,b; 1879 E.A.Smith, Proc.Zool.Soc.Lond. p.810; 1934 Mari, J.Conchyl.78:57; 1969 Barnard, Ann.Sth. Afric.Mus. 47:626, textfig.14a (radula); 1973 Kensley, Sea-shells South Africa p.160, fig.596.
1886. *Nassa (Hebra) muricata* Q. & G, Watson, Rept.Sci.Res.Voy.H.M.S."Challenger" 15:184; 1895 Melvill & Standen, J.Conch. 8:107; 1929 Dautzenberg, Faune Colon.Franc. 3:412; 1955 Marche-Marchad, J.Conchyl. 95:30.
1887. *Nassa muricata* var. *horrida* Dunker, v.Martens, J.Linn.Soc.Lond. 21:181.
1911. *Nassa (Hebra) horrida* Dunker, Schepman, Siboga-Exped. 49d:323; 1929 Dautzenberg, Faune Colon.Franc. 3:411; 1955 Marche-Marchad, J.Conchyl. 95:30.
1936. *Nassarius (?) horridus* (Dunker), Peile, Proc.Malac.Soc.Lond. 22:141, fig.6 (radula).
1939. *Scabronassa horrida* (Dunker), Peile, Proc.Malac.Soc.Lond. 23:276; 1966 Habe & Kosuge, Shells world col. 2:60, pl.22,fig.3.
1961. *Hebra curta* (Gould), Habe, Col.illust.shells Japan 2:64, pl.32,fig.20.
1972. *Hebra horrida* (Dunker), Cernohorsky, Rec.Auckland Inst.Mus. 9:189, figs.81-83, 89 (shell), figs.94,95 (radula); 1982 Kaicher, Card cat.world-wide shells, Pack No.31:card 3170.

Shell up to 16.0 mm in length, usually ovate and solid, teleoconch of 5½-6 whorls, protoconch of 3-3¼ milky-white embryonic whorls, last 1½ whorls carinate; post-embryonic whorls with thick axial ribs and 5-7 overriding, close-set spiral cords, sculpture becoming more variable and coarser on last two whorls, where spiral cords are either close-set and weakly nodose or more widely spaced and distinctly echinate; spiral cords number from 2-7 on the penultimate and from 6-19 on the body whorl, body whorl separated from swollen siphonal fasciole by a shallow trough; under magnification numerous longitudinal striae are visible. Aperture very narrow, outer lip thick, broadly variced, interior with irregular lirate denticles which extend into aperture, columellar callus thick and roundly spreading on to body whorl and sculptured with numerous lirae, small denticles and wrinkles, siphonal notch and anal canal prominent. Usually creamy-white in colour, irregularly marbled or banded with orange, brown or almost black, some individuals uniformly cream or orange-brown, aperture and columellar callus creamy-white, deep interior of aperture with dark bands. Operculum brown, margins irregularly and sparsely serrate.

TYPE LOCALITY. None *(horrida* and *scabrum)*; Samoa Is *(curta)*; Carteret Harbour, New Ireland, [Papua New Guinea] (*muricatum* Quoy & Gaimard); Rennell I, Solomon Is, is here designated as the type locality (specimens in ZMC).

DISTRIBUTION. From East and South Africa to India, Japan and the Samoa Is. In coral, weedy or muddy sand, from the intertidal zone to a depth of 22 m.

Type specimens. A syntype of *Hebra horrida* (Dunker), is in the Zoological Museum, Humboldt University, Berlin, length 13.8 mm, width 9.5 mm. Syntypes of *Nassa curta* Gould, are in the National Museum of Natural History, Washington, and the Museum of Comparative Zoology, Harvard University, and the syntype kept in the former Institution No.USNM-5722, length 11.4 mm, width 8.0 mm, is here selected as the lectotype (pl.44, fig.3). The type-specimens of *Buccinum muricatum* Quoy & Gaimard, are in the Museum National d'Histoire Naturelle, Paris.

Material examined. EAST AFRICA: Mazizini, W. Zanzibar (AIM); Bweju, S.E. Zanzibar (USNM); MADAGASCAR: taken at 21 different stations around Tulear (SMOM); MAURITIUS: (USNM); Point Pimente, W. side of Arsenal Bay (coll.Powell); Cannonier's Pt., 5 m (ZMC); Tamain Bay (AMS); REUNION I: Lagon de la Saline (coll.Martin); INDIA: Bombay (ZSI); ANDAMAN IS: (ZSI; ZMC); THAILAND: Ko Surin, Phanguga (PMBC); INDONESIA: reef at Malakoni, Enggano I, S. of Sumatra; Sanur Beach, Bali; Pantai Kelapa Lima, 5 km N. of Kupang, W. Timor (all coll.McCausland); PHILIPPINES: Point Naso, Panay I (USNM); Punta Engano, Mactan I, Cebu (coll.Deynzer); RYUKYU IS: Metasaki reef, Okinawa (Natal Mus.); CAROLINE IS: Mutunlik, Kusaie I; Yap I (both USNM); MARIANAS IS: Cruz Beach, Guam I (coll.Salisbury); off Orote Pt., Guam I, 18-22 m (coll.Deynzer); MARSHALL IS: N. end of Ujae I (USNM); PAPUA NEW GUINEA: Madang (LACM); Megiar Harbour, N. of Madang (AMS); Nonga, E. New Britain (coll.Parkinson); AUSTRALIA: Lizard I, Queensland (coll.Willan); W. side of Northwest Cape, West Australia (coll.Hansen); SOLOMON IS: Onegaghuga, S. of Hutuna, Rennell I; Lavangu, Rennell I (both ZMC); Konimbo Bay, Guadalcanal; Matui I; Marovo lagoon, New Georgia; Mendana (all Auckland Univ.); Tutuba, Espiritu Santo (coll.Cole); Russel I (coll.Potter); NEW HEBRIDES: Port Havannah; Kakula I, Undine Bay; Malapoa Pt., Vila Harbour; Pango Pt.; Tuki Tuki Pt., all Efate I (all AIM); Takara, Efate I (coll.Bratcher); Point Arbel, Vila (NMNZ); Lolowai, Aoba I (coll.Gardner); Aneityum (coll.Richardson); LOYALTY IS: Lifu I (coll.Powell); Ouvea I (coll.Cole); NEW CALEDONIA: Baie des Citrons, Noumea (coll.Cole); S. of Yate, east coast; Oubatche (both AMS); FIJI IS: Suva reef, Sth. Viti Levu; Manava I, N. off Viti Levu (both coll.Eker); Nukubuco Passage, S. Viti Levu (coll.Walton); 6 km E. of Sigatoka, W. Viti Levu (coll.Marrow); Nasese, Suva; Sth. of Cave I, Suva Bay; Sovi Bay, Sth. Viti Levu (all ZMC); Suva reef (coll.Northgrove); Levuka, Ovalau I (USNM); Lakeba I; Moce I; Karoni I, all Lau group (AIM); Lami, Suva (coll.McCausland); Wailagi Lala, 4-6 m; N.end of Vanua Balavu (both coll.Dickinson); TONGA IS: Niuatabutabu, 15°58'S & 173°48'W (ZMC); SAMOA IS: Apia Harbour; off Fuailalo, Upolu I, 4 m; Vailele Beach (all AIM); Mauono I, Upolu (AIM); Pago Pago (AMS); Mulivai, 12 m (coll.Scott.).

Hebra horrida is one of the commonest nassarids encountered on tropical Indo-Pacific reefs. It is occasionally confused with either *Nassarius quadrasi* (Hidalgo) or *N.echinatus* (A.Adams), but is easily separated on the basis of apertural features, i.e. the ovate, thick columellar callus which is closely wrinkled and plicate (Fig. 160-162).

"Hebra" junghuhni (K.Martin, 1895)
(Fig. 158)

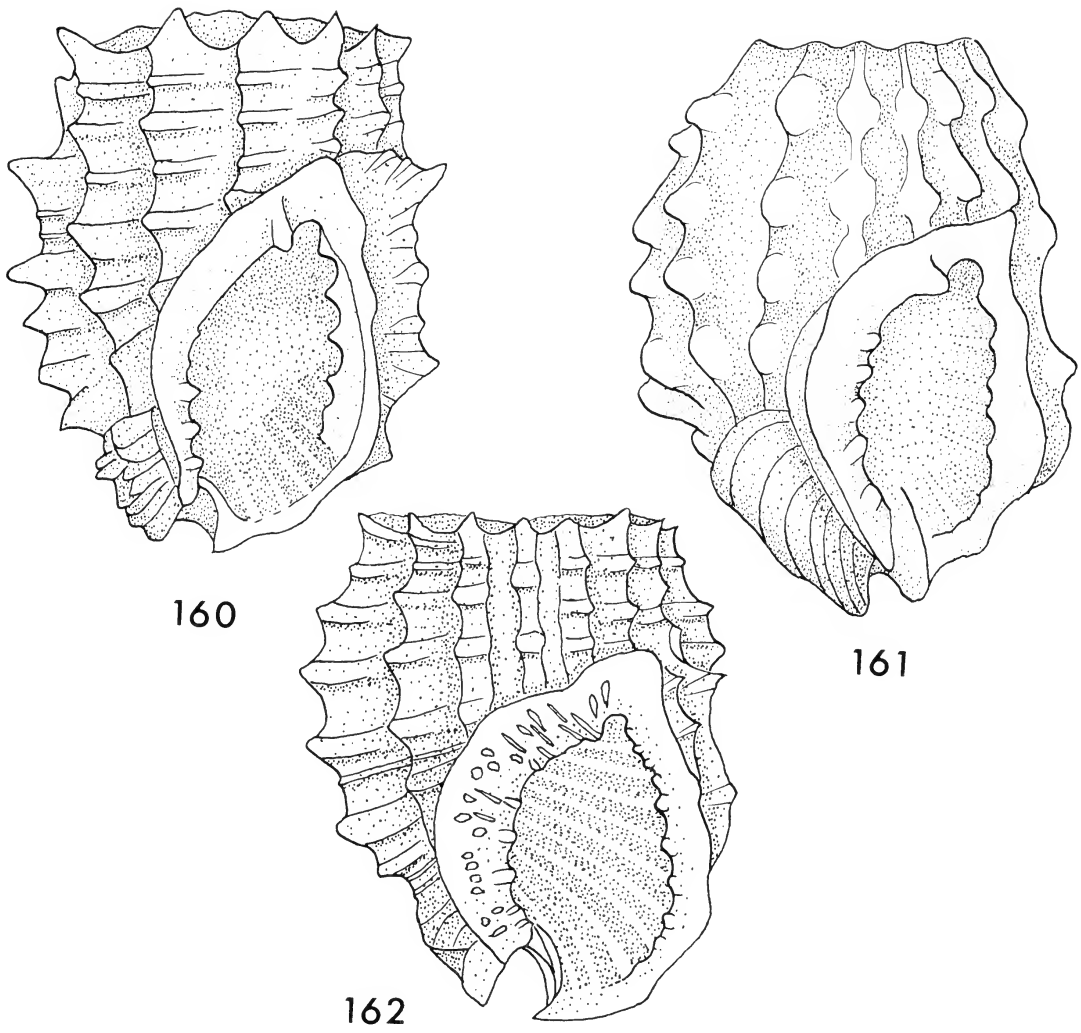
1895. *Nassa (Uzita) junghuhni* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S. 1:115, pl.17, figs.234,234a.

"Shell ovate, anteriorly squat, consisting of 6 whorls. The three embryonic whorls are smooth, remaining whorls sculptured with rounded axial ribs which are bisected by flattish spiral cords rendering the axials nodulose. Post-embryonic whorls already with 4 spirals, later whorls with 1-2 additional spirals, interspaces smooth. The sculpture of the body whorl is similar to that of earlier whorls. Aperture ovate, siphonal canal oblique and wide, columella concave, columellar callus well developed (but not developed in the illustrated individual), smooth centrally, but anteriorly with insignificant denticles and wrinkles, parietal denticle present; interior of outer lip with 13-15 lirae.

Two examples are known, both of which originated from the old Museum collection and have been presumably brought back by Junghuhn. Both are imbedded in matrix which is overgrown with the same Balanidae, giving the impression that they both originate from the same deposit. The illustrated specimen is marked "Java", whereas the other, better preserved specimen (discovered subsequently and therefore not illustrated), lacks locality data." (Abridged translation).

TYPE LOCALITY. Fossil from Java, Indonesia (age unknown).

DISTRIBUTION. Unknown.



Figs. 160-162. Apertural features. 160. *Nassarius (Niotha) quadrasi* (Hidalgo). 161. *N. (N.) echinatus* (A.Adams). 162. *Hebra horrida* (Dunker).

Type specimens. The two syntypes of *H.junghuhni* (K.Martin), are in the Rijksmuseum van Geologie en Mineralogie, Leiden.

The illustrated specimen superficially resembles juvenile individuals of *Hebra horrida* (Dunker), but has even a closer resemblance to juvenile specimens of *Cantharus* Roeding, family Buccinidae.

Hebra subspinosa (Lamarck, 1822)
(Plate 44, figs.5-9)

1822. *Buccinum subspinosum* Lamarck, Hist.nat.anim.s.vert. 7:273; 1834 Kiener, Spéc.gen.icon.coq.viv. 9:94, pl.26,fig.103.
1874. *Nassa (Hima) sistroidea* G. & H.Nevill, J.Asiat.Soc.Bengal 43(2):24, pl.1,fig.6; 1879 E.A.Smith, Proc.Zool.Soc.Lond. p.809.
1883. *Nassa (Hebra) subspinosa* (Lamarck), K.Martin, Samml.geol.Reichs-Mus.Leiden, (1) 3:123; 1898 Melvill & Sykes, Proc.Malac.Soc.Lond. 3:38; 1911 Schepman, Siboga-Exped. 49d:323; 1915 Tesch in Wanner, Palaeont.v.Timor 5:56, pl.81,figs.123a,b; 1927 Fischer in Wanner, Palaeont.v.Timor Lief.15(25):23; 1938 Adam & Leloup, Mem.Mus.d'Hist.Nat.Belg.2:182.
1897. *Nassa (Hebra) sistroidea* Nevill, Melvill & Sykes, Proc.Malac.Soc.Lond. 2:169.
1914. *Nassa sistroidea* G. & H.Nevill, Rec.Indian Mus.Calcutta 10:297; 1915 Preston, Rec.Indian Mus.Calcutta 11:290.
1930. *Nassarius (Hebra) subspinosus* (Lamarck), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:60.
1934. *Nassa subspinosa* (Lamarck), Mari, J.Conchyl. 78:60.

1957. *Nassarius subspinosus* (Lamarck), Kaicher, Indo-Pacif.sea shells pl.7, fig.22.
1966. *Scabronassa subspinosa* (Lamarck), Habe & Kosuge, Shells world col.2:60, pl.22,fig.9.
1972. *Hebra subspinosa* (Lamarck), Cernohorsky, Rec.Auckland Inst.Mus. 9:190, figs.84-86 (shell), fig.96 (radula); 1982 Kaicher, Card.cat.worldwide shells, Pack No.31:card 3226.

Shell up to 20.0 mm in length, solid and ovate, teleoconch of 4½-5 whorls which are angulate or subangulate on the presutural ramp, apex eroded in specimens examined; whorls adpressed, descending concavely from suture to presutural ramp where thick, crude axial ribs commence and descend on to anterior suture; strong spiral cords are present in the concave area, and later override axial ribs and form 1-3 spiral rows of blunt or spinose nodules; in some individuals the nodules are barely distinguishable on body whorl; area posteriorly to siphonal fasciole with 2 cords, siphonal fasciole strongly corded. Aperture narrow, outer lip thickened but narrowly variced, interior denticulate, columella concave and narrowly calloused, smooth apart from 2-3 minute denticles anteriorly, siphonal notch and anal canal distinct. White in colour, centre of body whorl with a greenish-brown band and additional interrupted dark brown spiral lines, aperture brown, denticles lilac in colour. Operculum brown and simple at margins.

TYPE LOCALITY. None *(subspinosa)*; Andaman Is *(sistroidea)*. Amboina, Indonesia, is here designated as the type locality.

DISTRIBUTION. From India to China and the Fiji Is. On reefs, on a hard substrate, intertidal.

Type specimens. Two syntypes of *Hebra subspinosa* (Lamarck), are in the Museum d'Histoire Naturelle, Geneva, No. 1102/6/1-2, and the complete specimen measuring length 14.0 mm, is here selected as the lectotype (pl.44, fig.5). The type-specimens of *Nassa sistroidea* G. & H.Nevill, are presumably in the Zoological Survey of India, Calcutta, original dimensions length 17.0 mm, width 11.0 mm.

Material examined. ANDAMAN IS: (ZSI); MALAYSIA: Singapore (ZMC); INDONESIA: Morotai, Halmahera group; Tomahu I, Molucca Sea (both USNM); Amboina (AMS); Kupang, W. Timor; between Palu and Dongalla, Central Sulawesi; Enggano I, Sth. of Sumatra; Pantai Pura, N. of Kupang, W. Timor; Pantai Kelapa Lima, N. of Kupang, W. Timor (all coll.McCausland); PHILIPPINES: Olango I, E. of Cebu; Cape Santiago, Luzon; near Cebu City, Cebu I; Masingin I, Jetape, Bohol I (all AIM); Panabutan Bay, Mindanao; Port Matalai, Luzon; Guijulugan, Negros; Mactan I, Cebu; Olongapo, Luzon; Cabugao, Catanduanes; Alabat, off Luzon; Cebu, Cebu I; Marinduque; Tilig, Lubang; Point Naso, Pandy; Masinquin I, Bohol I (all USNM); Masingiu I, Bohol (AMS); Dungaree Beach, Subic Bay (coll.Salisbury); CHINA: Whampoa (USNM); WEST IRIAN: Middleburgh I (AMS); PAPUA NEW GUINEA: Manokwari; Milne Bay (both USNM); AUSTRALIA: Port Hedland, West Australia (coll.Powell); SOLOMON IS: Gizo I; Mendana (both Auckland Univ.); Ata I (AMS); NEW HEBRIDES: Tuki Tuki Pt., Efate I; Bushmen's Bay, Malekula I (both coll.Eker); Vila Harbour, Efate I (Auckland Univ.); Pango Beach and Undine Bay, Efate I (coll.Cole); Point Arbel (NMNZ); Malapoa Pt.; Takara; Erakor reef, all Efate I (all coll.Bratcher); Ile Vate; Santo (both AMS); Lolowai, Aoba I (coll.Gardner); FIJI IS: Nukubuco Passage, Sth. Viti Levu (coll.Walton); 6 km E. of Sigatoka, S.W. Viti Levu (coll.Marrow); 12-15 km E. of Bau I, Sth. Viti Levu; Vatua village, Korolevu, Sth. Viti Levu (both ZMC); St.Annes and Suva, Sth. Viti Levu (coll.Gardner); Korolevu and Deuba, Sth. Viti Levu (AMS); Lami, Suva (coll.McCausland); Savusavu Pt. (coll.Dickinson).

Fossil record. PLIOCENE: Fatu Lulih, Fialarang, Timor (K.Martin 1883); between Kampong Dasoeli and Lahoeroes, Fialarang, Timor (Tesch in Wanner 1915); Bulabore, Timor (Fischer in Wanner 1927).

The species is variable in sculpture. The typical form has 3 spiral rows of main nodules, and many specimens were examined where only 1 or 2 rows of nodules were developed. In some rare individuals from Indonesia, nodules were almost obsolete and were replaced by strong spiral cords (pl.44, fig.9).

"Hebra" kondangensis (Oostingh, 1939)
(Fig. 159)

1939. *Nassarius (Niotha) conoidalis* forma *kondangensis* Oostingh, Ing.Ned.Indie Mijnb.Geol. 6(12):184, pl.16,fig.289.

"A small shell with almost 4 post-embryonic whorls which are distinctly angulate and carry a blunt edge, area between suture and ramp concave, spiral cords as wide as axial ribs; the net-like sculpture produces laterally elongated nodules. Ribs 12-14 per whorl, interspaces of ribs initially as wide as the ribs, on body whorl interspaces are twice as broad as axial ribs, penultimate whorl with 4 spiral cords, body whorl with 9 cords. Interior of aperture with 8 lirae, columella moderately narrow." (Abridged original description.)

TYPE LOCALITY. Tjikondang, Tjimandiri, Sth. Bantam, Java, Pliocene of Indonesia.

DISTRIBUTION. Pliocene of Indonesia.

Type specimens. The holotype of *H.kondangensis* (Oostingh), is presumably in the Museum of Bandoeng, Indonesia. The original dimensions were length 5.5 mm, width 3.5 mm.

The described species bears no relationship with *N.conoidalis* (Deshayes in Bélanger), but resembles immature specimens of *Hebra subspinosa* (Lamarck). It is tentatively placed in *Hebra*, pending examination of the type material.

Hebra corticata (A.Adams, 1852)
(Plate 44,figs.10-13; Plate 45,figs.1-5)

1852. *Nassa corticata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:98; 1854 Reeve, Conch.Icon. 8:pl.28, fig.189.
1853. *Nassa vibex* Reeve, Conch.Icon. 8:pl.12, fig.81 (non Say, 1822).
1854. *Nassa nigra* Rousseau, Voy.Pole Sud, Moll.5:78, pl.21,figs.18,19.
1874. *Nassa lirata* Marrat, Ann.Mag.Nat.Hist. (4), 13:70; 1877 Marrat, Prop. new forms genus *Nassa* p.6,pl.1,figs.18,19 (called *lirella* and *lyrata* by Marrat in 1880); 1887 v.Martens, J.Linn.Soc.Lond. 21:182 (non *Nassa lirata* Dunker, 1860).
1876. *Nassa trinodosa* E.A.Smith, J.Linn.Soc.Lond.Zool. 12:545, pl.30,fig.2.
1877. *Nassa sculpta* Marrat, Prop.new forms genus *Nassa* p.5,pl.1,fig.30 (non *Buccinum (Nassa) sculptum* Dunker, 1853 = *Nassarius*).
1880. *Nassa scalpta* Marrat, Var.shells genus *Nassa* p.104 (nom.subst.pro *N.sculpta* Marrat, 1877).
1904. *Nassa solida* Hidalgo, Rev.R.Accad.Cienc.Madrid 1:205 (nom.subst.pro *N.vibex* Reeve, 1853) [non *Nassa solida* Bell, 1898].
1928. *Nassa (Hebra) solida* "Reeve", Mari, Butl.Inst.Catalana Hist.Nat. (2), 8:139, pl.6,fig.6.
1929. *Nassa (Phrontis) tiarula* Kiener, Dautzenberg, Faune Colon.Franc. 3:411 (non *Buccinum tiarula* Kiener, 1841 = *Nassarius*).
1930. *Nassarius (Phrontis) liratus* (Marrat), Bisacchi, Ann.Mus.Civ.Stor.Nat.Genova 55:53.
1966. *Scabronassa nigra* (Hombron & Jaquinot), Habe & Kosuge, Shells world col.2:62, pl.22,fig.28.

Shell up to 18.0 mm in length, solid, teleoconch of 5-5½ whorls which are subangulate to angulate on the presutural ramp, apex and protoconch usually eroded; sculptured with angulate axial ribs, ribs obsolete between suture and presutural ramp on last 2 whorls. Ribs frequently become obsolete towards the base on the dorsal side of the body whorl; spiral sculpture consists of spiral cords which vary in strength but are usually more prominent on the presutural ramp where they are more elevated and form either blunt nodes or more spinose nodules; spiral sculpture is more distinct on the ventral side of the body whorl, dorsal side with 1-3 rows of either blunt nodes or more spinose nodules, siphonal fasciole frequently recurved toward aperture and spirally corded. Aperture moderately narrow, outer lip narrow and variced, interior with 5-6 denticles, columellar callus moderately narrow but slightly widening and more impressed anteriorly, smooth apart from 1-3 denticles anteriorly, siphonal notch deep, anal canal very deep and almost wedge-shaped and bordered by the parietal denticle and a strong posterior denticle. Variable in colour, usually greenish-grey, tan, brown to almost blackish-brown, light coloured specimens ornamented with continuous or interrupted dark brown bands, dark coloured specimens with a white or yellow, narrow band anterior to the presutural ramp; some individuals are tan or light brown on the spire whorls and almost blackish-brown on the body whorl, aperture cream, light brown to dark purple-brown, interior with a pale band. Fresh specimens have a thin, opaque, light brown periostracum. Operculum brown and simple at margins.

TYPE LOCALITY. New Zealand = error! *(corticata)*; Philippines *(vibex* Reeve; *solida* Hidalgo; *lirata* Marrat; *sculpta* Marrat ["New Zealand" on plate explanation]; *scalpta)*; San Christoval, Solomon Is *(trinodosa)*. Cebu, Philippines, is here designated as the type locality (specimens in USNM; LACM; ZMC).

DISTRIBUTION. From India to the Philippines, the New Hebrides and New Caledonia. On reefs, under rocks, near river mouth and among mangroves, in mud or muddy sand, usually within the intertidal zone.

Type specimens. Three syntypes of *Hebra corticata* (A.Adams) are in the British Museum (N.H.), London, No.197326, and the specimen measuring length 11.7 mm, width 7.1 mm, is here selected as the lectotype (pl.44, figs.10,11). Two syntypes of *Nassa vibex* Reeve (also types of *N.solida* Hidalgo), are in the same Institution (no number), length 16.0 mm and 17.8 mm respectively. A specimen of *Nassa nigra* Rousseau, in the Museum National d'Histoire Naturelle, Paris, is marked "type of *N.nigra* and *N.exigua*" in error; it is not the specimen illustrated as *N.nigra* but is the specimen figured as *N.exigua* Rousseau. Nine syntypes of *N.lirata* Marrat are in the Merseyside County Museum, Liverpool, and the specimen measuring length 17.0 mm, width 9.3 mm, is here designated as the lectotype (pl.44, fig.12). Eighty-eight syntypes of *N.sculpta* Marrat (also the types of *N.scalpta* Marrat) [90% of these syntypes being juvenile and immature], are in the same Institution, and the specimen measuring length 13.0 mm, width 8.0 mm, is here designated as the lectotype (pl.44, fig.13). The holotype of *N.trinodosa* E.A.Smith, is in the British Museum (N.H.), London, No.1973168, length 13.0 mm, width 7.4 mm.

Material examined. ANDAMAN IS: (ZSI; USNM); THAILAND: Ao Nam Bor, Phuket (PMBC); Koh Phuket I (coll.Orr); INDONESIA: between Palu and Dongalla, Central Sulawesi; Pantai Pura, N. of Kupang, W. Timor; Kalahabi Harbour, Alor I, N. of Timor; Nusa Tenggaru, Timor; Kendari Harbour, Sulawesi; W. end of Teluk Kao, Halmahera (all coll.McCausland); Kudat Bay, Nth. Borneo (USNM); Telok Assam, Sarawak, Borneo (coll.Richardson); PHILIPPINES: Cebu I (ZMC); reef off Cebu; Ulugan, Palawan group; Davao, Mindanao; Tayabas; Luzon; Ilo Ilo, Panay I; Santa Margarita, Samar (all USNM); Cebu, Cebu I (LACM); Batangas Province (coll.Vermeij); Matabungkai, 115 km S.S.W. of Manila; Mindanao (both AMS); PAPUA NEW GUINEA: Port Moresby Bay (USNM); Taurama Pt., Port Moresby; Kapa Kapa, S.E. of Port Moresby (both AMS); Rabarua, E. New Britain; Kimbe, W. New Britain (both coll.Parkinson); Nui I, Madang Harbour (AMS); AUSTRALIA: Murray river near Tully; Cape York, both Queensland (AMS; BMNH); SOLOMON IS: Ata I (AMS); NEW HEBRIDES: Santo I, near river mouth (coll.Willan); Surunda, Espiritu Santo (coll.Cole); Aneityum I (coll.Richardson); Malapoa Pt. reef, Efate I (coll.Colardeau); NEW CALEDONIA: Poindimie (AMS); Bourail (coll.Lamb).

The lectotype of *H.corticata* is a somewhat atypical individual with evanescent axial ribs and a weak spiral sculpture. The form *nigra* Rousseau, is a frequently encountered form with a row of nodes on the presutural ramp and obsolete spiral sculpture on the dorsum. The forms *sculpta* Marrat and *trinodosa* E.A.Smith, are slightly broader and spirally corded, and the three spiral rows of nodes are only indicated but not really prominent, while in the form *solida* Hidalgo, the three spiral rows of nodes are fully developed and spinose.

Hebra oberwimmeri (Preston, 1907)
(Plate 45, figs.6-10)

1854. *Nassa exigua* Rousseau, Voy.Pole Sud, Moll. 5:78, pl.21,figs.26,27 (non *Buccinum exiguum* Brocchi, 1814 = *Nassarius*).
1907. *Nassa oberwimmeri* Preston, J.Conchyl. 54:268, textfig.2.

Shell up to 13.0 mm in length but frequently smaller, solid, teleoconch of 4½-5 convex whorls, protoconch missing in all specimens examined; sculptured with axial ribs which continue to the back of the outer lip and number from 13-18 on the penultimate and from 10-16 on the body whorl; spiral sculpture consists of finely impressed spiral grooves which produce narrow, flattish spiral threads numbering from 7-9 on the penultimate and from 8-10 on the posterior half of the body whorl and an additional 7-10 spiral cords on the anterior half of body whorl, siphonal fasciole with 6-8 oblique cords, siphonal fasciole short. Aperture narrow, outer lip thickened and prominently variced, interior with 5-8 denticles, anterior denticle bordering siphonal canal usually prominent, columella narrowly calloused, smooth apart from 1-3 denticles basally, siphonal notch prominent, anal canal deep and bordered by the parietal denticle and a posterior denticle. Greyish-brown to dark brown in colour, spire whorls with a narrow white or yellowish spiral band anterior to suture and a peripheral band of the same colour on body whorl, aperture brown with pale bands, columellar callus greyish-white to brown, siphonal canal usually dark brown.

TYPE LOCALITY. Solomon Is (*exigua* Rousseau); Fiji Is *(oberwimmeri).*

DISTRIBUTION. To date known only from the Solomon and Fiji Is. On reefs and near mangroves, within the intertidal zone.

Type specimens. The holotype of *Hebra oberwimmeri* (Preston), is in the British Museum (N.H.), London, NO.1923.2.20.9, length 9.8 mm, width 5.3 mm. The holotype of *Nassa exigua* Rousseau, is in the Museum National d'Histoire Naturelle, Paris, length 13.0 mm, width 7.4 mm.

Material examined. FIJI IS: Nukumaroreko Islet, Suva Bay, 18°07'S & 178°24'E (ZMC); Lami, Suva, Sth. Viti Levu (coll.McCausland); near Vatia wharf, N.W. Viti Levu; southern tip of the Yasawa group (both coll.Eker).

The extant holotype of *Nassa exigua*, which is also erroneously marked as being the type of *N.nigra* Rousseau, is the specimen illustrated by Rousseau (1854) as *N.exigua*, and not *N.nigra*.

Genus **Demoulia** Gray, 1838

Demoulia Gray, 1838, Ann.Mag.Nat.Hist. (1), 1:29. Type species by SD (Herrmannsen, 1847) *Buccinum retusum* Lamarck, 1822 = *Nassa ventricosa* Lamarck, 1816. Recent, South Africa.
1847. *Desmoulea* Gray, Proc.Zool.Soc.Lond. p.114 (invalid emendation).
1851. *Desmoulinsia* Woodward, Man.Mollusca p.112 (nom.subst.pro *Desmoulea* Gray, 1847).
1856. *Streptorhega* Bronn, Lethaea Geog. 3:563 (nom.subst.pro *Desmoulea* Gray, 1847).
1874. *Moulinsia* Tournouer, J.Conchyl. 22:295 (nom.subst.pro *Desmoulea* Gray, 1847) [non *Moulinsia* Grateloup, 1840].

Shell up to 45.0 mm in length, inflated, elongate-ovate to depressed globose, body whorl rotund, spire shorter than body whorl; sculptured with numerous, close-set spiral threads, axial sculpture absent. Aperture narrow, outer lip thick, interior prominently lirate, columella narrowly calloused and

with a prominent concave anterior kink in the region of the siphonal fasciole, columella with small horizontal denticles, siphonal notch prominent, parietal denticle swollen, anal canal deep.

Radula with rachidians similar to *Nassarius s. lato*, with a concave base and 8-9 cusps. Laterals bicuspid; differ from other Nassariinae in having a longer and more slender (especially at the base) and straighter inner cusp.

GEOGRAPHICAL DISTRIBUTION. West and South Africa.

STRATIGRAPHICAL RANGE. Miocene to Recent.

Species of the genus *Demoulia* were already living during Miocene times in southern Europe (fig.163), and prior to their extinction in the Mediterranean region, made their way to West Africa and ultimately South Africa.

The genus contains only 3 species and 1 subspecies, and only 1 species is known from West Africa.

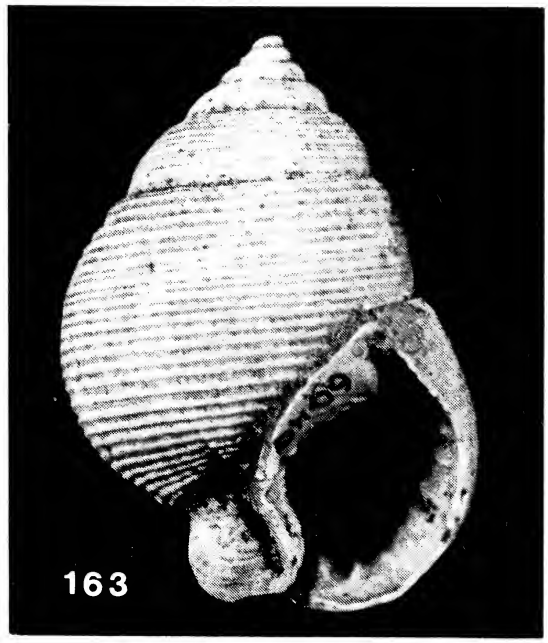


Fig. 163. *Demoulia conglobata* (Brocchi). Piedmont, Italy, Upper Miocene. N.Z.Geological Survey No. 6040; 39.0 mm.

Demoulia obtusata (Link, 1807)
(Plate 45, figs.11,12; Plate 46, figs.1-3)

1788. *"Buccinum cassideum abbreviatum varietates"* Chemnitz, Syst.Conchyl.-Cab. 10:194, pl.153, fig.1466 (non binom).
1807. *Buccinum obtusatum* Link, Beschr.Nat.-Samml.Univ.Rostock, 3rd Abth., p.126 (ref. Chemnitz, op.cit., fig.1466); 1936 Tomlin & Winkworth, Proc.Malac.Soc.Lond. 22:40.
1838. *Demoulia pulchra* Gray, Ann.Mag.Nat.Hist. (1), 1:29; 1891 E.A.Smith, Ann.Mag.Nat.Hist. (6), 8:322.
1853. *Desmoulea pinguis* A.Adams, Proc.Zool.Soc.Lond. Pt.19:113; 1858 H. & A.Adams, Gen.Rec.Moll. 3:pl.12,figs.6,6a; 1882 Kobelt, Jahrb.deut.Malak.Gesell. 9:29; 1884 Tryon, Man.Conch. 4:65, pl.18, figs.362-364.
1853. *Desmoulea crassa* A.Adams, Proc.Zool.Soc.Lond. Pt.19:113; 1882 Kobelt, Jahrb.deut.Malak.Gesell. 9:29.
1854. *Nassa pinguis* A.Adams, Reeve, Conch.Icon. 8:pl.29,figs.193a,b; 1956 Knudsen, Atlantide Exped. No.4:55.
1854. *Nassa ponderosa* Reeve, Conch.Icon. 8:pl.29,fig.196 (nom.subst.pro *Desmoulea crassa* A.Adams, 1853); 1932 Tomlin, Proc.Malac.Soc.Lond. 20:96.
1869. *Nassa (Desmoulea) tryoni* Crosse, J.Conchyl.17:409; 1871 Crosse, J.Conchyl. 19:70, pl.1,fig.3.
1882. *Desmoulea pulchra* Gray, Kobelt, Jahrb.deut.Malak.Gesell. 9:29.
1913. *Desmoulinsia pinguis* (A.Adams), Dautzenberg, Ann.l'Inst.Ocean.Monaco 5:33.
1929. *Nassa (Desmoulea) pinguis* A.Adams, Thiele, Handb.syst.Weicht. 1:323, textfig.366 (radula); 1932 Tomlin, Proc.Malac.Soc.Lond. 20:43; 1950 Nickles, Man.Ouest-Afric. 2:105, fig.183.
1975. *Demoulia obtusata* (Link), Cernohorsky, Rec.Auckland Inst.Mus. 12:164, figs.86-89.

Shell up to 30.0 mm in length, solid and globose, teleoconch of 5½-6 whorls, whorls short and inflated, last whorl large and globose, protoconch unknown, sutures narrowly canaliculate; axial sculpture almost obsolete and consisting of numerous, slightly irregular longitudinal growth-striae; spiral sculpture dominant, consisting of numerous encircling spiral striae which number from 5-11 on the penultimate and from 20-30 on the body whorl, siphonal fasciole short and broad and with a few oblique cords. Aperture narrow, outer lip thick and variced, interior with 7-10 prominent lirae and 3-4 minute denticles prosteriorly, columella narrowly calloused, callus broader above swollen parietal wall and narrowing anteriorly with a distinct bend in the columella near the siphonal notch, anal canal very deep. Cream in colour, ornamented with clouded brown zones, or brown with whitish axial streaks, sutures frequently with a whitish and yellowish-brown spotted band, aperture white, periostracum thin and brown.

TYPE LOCALITY. None *(obtusata* and *tryoni)*; Sierra Leone, West Africa *(pulchra)*; Senegal, West Africa *(pinguis)*; Japan = error! *(crassa* and *ponderosa)*. Senegal, West Africa, is here designated as the type locality (specimen in BMNH).

DISTRIBUTION. From Morocco to Togo, West Africa. Habitat unknown.

Type specimens. The type-specimen of *Demoulia obtusata* (Link) is no longer extant, and the type-figure from Chemnitz, 1788, vol.10, plate 153, figure 1466, is here designated as the illustrated lectotype (pl.45, fig.11). The following type specimens are in the British Museum (N.H.), London: the holotype of *Demoulia pulchra* Gray, No.1973177, length 19.3 mm, width 15.4 mm; three syntypes of *"Desmoulea" pinguis* A.Adams (no number), and the specimen measuring length 22.0 mm, width 18.0 mm, is here designated as the lectotype (pl.46, fig.1); and the worn holotype of *"Desmoulea" crassa* A.Adams (which is also the type of *Nassa ponderosa* Reeve), length 22.4 mm, width 18.0 mm. The holotype of *Nassa tryoni* Crosse, is in the "Journal de Conchyliologie" collection, Museum National d'Histoire Naturelle, Paris, length 28.0 mm, width 19.0 mm.

Material examined. WEST AFRICA: Senegal; Sierra Leone (both BMNH); Tacoradi, Togo (ZMC).

The taxonomy of this species has been discussed in detail by Cernohorsky (1975a). It has been pointed out that E.A.Smith (1891b) who had the opportunity to compare the type-specimens of *D.pulchra, D.pinguis, D.crassa* and *D.ponderosa*, arrived at the conclusion that all these "species" were conspecific and that the species should be known as *D.pulchra* Gray, 1838. Tomlin (1932a), who also worked with the actual types, also pronounced *D.pinguis* as conspecific with *D.pulchra*. Despite Gray's (1838) good locality and description, his taxon has been ignored after 1932, and the species is listed as *D.pinguis* A.Adams, in West African faunal lists. It has been further established that *Demoulia obtusata* (Link), which has been based on a good figure and excellent description in Chemnitz (Martini & Chemnitz 1769-1795), is the oldest name applicable for this species, and that the taxon does not qualify as a *nomen oblitum* since it has been discussed in literature by Tomlin & Winkworth (1936).

Demoulia abbreviata (Gmelin, 1791)
(Plate 46, figs.4,5)

1788. *"Buccinum cassideum abbreviatum"* Gmelin, Syst.Conchyl.-Cab. 10:194, pl.153, fig.1463-64 (non binom).
1791. *Buccinum abbreviatum* Gmelin, Syst.Nat.ed.13:3478 (ref.Chemnitz, op.cit., figs.1463-64); 1825 Wood, Ind.Testac. p.104, pl.22,fig.12a; 1858 Kuester, Syst.Conch.-Cab.Martini & Chemnitz, ed.2, 3(1a):6, pl.2,fig.6.
1798. *Cassis glans* Roeding, Mus.Bolten. p.31 (ref.Chemnitz, op.cit., figs.1463-64).
1825. *Buccinum cassideum* Sowerby, Cat.shells coll.Tankerville, p.74 (ref.Chemnitz), op.cit., figs.1463-64).
1828. *Nassa globosa* Sowerby, Gen.Rec.foss.shells Pt.25:pl.245, fig.6.
1842. *Nassa abbreviata* Wood, Reeve, Conch.Syst. 2:237, pl.269,fig.6; 1854 Reeve, Conch.Icon. 8:pl.29,fig.194.
1859. *Desmoulea abbreviata* (Gmelin), Chenu, Man.Conchyl. 1:161, fig.762; 1886 Sowerby, J.Conch. 5:4; 1915 Bartsch, U.S.Nat.Mus.Bull. 91:52.
1874. *Desmoulea abbreviata* Chemnitz, v.Martens, Jahrb.deut.Malak.Gesell. 1:139; 1882 Kobelt, Jahrb.deut. Malak.Gesell. 9:28.
1892. *Demoulia abbreviata* (Gmelin), Sowerby, Mar.shells Sth. Africa p.13; 1928 Tomlin, Ann.Sth. Afric.Mus. 25:326; 1959 Barnard, Ann.Sth. Afric.Mus. 45:122, fig.22L (radula); 1969 Barnard, Ann.Sth. Afric.Mus. 47:629; 1973 Kensley, Sea shells Sth. Africa p.158,fig.583.
1903. *Nassa (Desmoulea) abbreviata* Chemnitz, v.Martens, Wiss.Ergeb.deut.Tief.-Exped. "Valdivia" 7:28.
1904. *Nassa (Demoulia) abbreviata* Wood, E.A.Smith, J.Malac.11:23.

Shell up to 40.0 mm in length, usually globose, teleoconch of 5½-6 convex whorls, protoconch of 2+ embryonic whorls, sutures with a narrow, shallow channel; axial sculpture absent, only numerous, weak longitudinal striae being present, spiral sculpture prominent and consisting of flat-

tish spiral cords which number from 6-11 on the penultimate and from 14-20 on the body whorl, 4-5 cords anterior to sutures thin and crowded, area between base of body whorl and siphonal fasciole with a shallow trough, fasciole short and broad and with 7-10 oblique cords. Aperture moderately narrow, outer lip thickened, varix indicated by a fold on the back of the outer lip, interior of aperture with 10-13 denticles, columella calloused, callus spreading posteriorly and showing a protruding sculpture of 7-8 horizontal cords, base of columella laminate anteriorly and with 2-4 denticles, siphonal canal narrow, oblique and deep, anal canal distinct. White to fawn in colour under a moderately thick, brown, fibrous periostracum, some specimens with small orange-brown spots at sutures and a few nebulous streaks of the same colour, aperture white to cream. Operculum thin, triangular, with scarious edges (*fide* Barnard 1959).

TYPE LOCALITY. Indian Ocean = error! *(abbreviata)*; none (*glans; cassideum; globosa)*. Port Alfred, South Africa, is here designated as the type locality.

DISTRIBUTION. From the Cape of Good Hope to Natal, South Africa. Subtidal, to a depth of 100 m.

Type specimens. The type-specimens of *Demoulia abbreviata* (Gmelin), are no longer extant, and the specimen illustrated by Chemnitz, 1788 (Martini & Chemnitz 1769-95) on plate 153, figures 1463, 1464, is here designated as the illustrated lectotype (pl.46, fig.4) of *D.abbreviata* (Gmelin), *Cassis glans* Roeding, and *Buccinum cassideum* Sowerby. The type-specimen of *Nassa globosa* Sowerby, has not been located.

Material examined. SOUTH AFRICA: Cape of Good Hope; Rooi Els Bay, Cape (both NMV); Jeffrey's Bay; Port Alfred (both USNM); Algoa Bay (AMS); Natal (SDMNH).

Literature records. SOUTH AFRICA: Gordon's Bay; False Bay; Algoa Bay; Natal, 33-95 m (Tomlin 1928); St.Francis Bay, 80-100 m; off Knysna, 95 m (Barnard 1959); Saldanha Bay (Barnard 1969).

Demoulia ventricosa ventricosa (Lamarck, 1816)
(Plate 46, figs.6-8)

1816. *Nassa ventricosa* Lamarck, Tabl.Encycl.Meth. p.1, pl.394,figs.3a,b.
1822. *Buccinum retusum* Lamarck, Hist.nat.anim.s.vert. 7:270; 1834 Kiener, Spec.gen.icon.coq.viv. 9:87, pl.24,fig.94.
1829. *Cassis globulus* Menke, Verz.Conchyl.Samml.Malsburg p.37 (non Roeding, 1798).
1854. *Nassa retusa* (Lamarck), Reeve, Conch.Icon. 8:pl.29,figs.195a,b; 1904 E.A.Smith, J.Malac. 11:23.
1859. *Desmoulea retusa* (Lamarck), Reeve, Conch.Icon. 8:pl.29,figs.195a,b; 1904 E.A.Smith, J.Malac. 11:23.
1859. *Desmoulea retusa* (Lamarck), Chenu, Man.Conchyl. 1:161,fig.763; 1886 Sowerby, J.Conch. 5:4; 1915 Bartsch, U.S.Nat.Mus.Bull. No.91:52.
1880. *Nassa obtusa* "Chem", Marrat, Var.shells genus *Nassa* p.68 (ref.Reeve, 1854, pl.29,figs.195a,b).
1959. *Demoulea retusa* (Lamarck), Barnard, Ann.Sth. Afric.Mus. 45:122; 1969 Barnard, Ann.Sth. Afric.Mus. 47:629, fig.14c (radula); 1973 Kensley, Sea-shells South Africa p.158, fig.584.
1972. *Demoulia ventricosa ventricosa* (Lamarck), Kilburn, Ann.Natal Mus. 21:419, textfig.7d.

Shell up to 30.0 mm in length, pupiform-cylindrical, teleoconch of 5-6 convex whorls, sutures shallowly incised, protoconch missing in all specimens examined; axial sculpture consists of macroscopically fine, longitudinal striae, spiral sculpture prominent and consisting of moderately regular, fine, flattish and crowded spiral threads which number from 15-23 on the penultimate and from 45-56 on the body whorl, siphonal fasciole moderately broad and keeled and with 8-14 oblique cords. Aperture moderately narrow, somewhat elongate and constricted posteriorly, outer lip thickened but only weakly variced through a fold and sometimes a few axial threads, interior with 11-15 denticles, intercalate denticles usually present, columella narrowly calloused, parietal denticle swollen and denticulate, base of columella recurved towards aperture and with a groove adjacent to the basal fold, denticles on columella number from 6-17, siphonal notch and anal canal deep. Usually fawn, tan or orange-brown in colour, sutures ornamented with brown and white spots, some spiral cords lined with brown and white and occasionally forming 2 narrow zones on body whorl; some individuals are white to bluish-white and variously blotched with brown. Periostracum thin, fibrous and yellowish-brown. According to Barnard (1959) the operculum is triangularly ovoid and irregularly jagged at margins, and the animal is pale orange in colour.

TYPE LOCALITY. None (*ventricosa; retusum; globulus* Menke); Port Elizabeth, South Africa *(obtusa)*. Algoa Bay, South Africa, designated by Kilburn (1972).

DISTRIBUTION. From False Bay to the Transkei-Pondoland coast, South Africa. Subtidal, from 9-100 m.

Type specimens. The type-specimens of *Demoulia ventricosa* (Lamarck) or *Buccinum retusum* Lamarck, have not been located, but they still may be among the general collection of the Museum d'Histoire Naturelle, Geneva. The type-specimens of *Cassis globulus* Menke, and *Nassa obtusa* Marrat, are no longer traceable.

Material examined. SOUTH AFRICA: Algoa Bay (AIM; AMS); Jeffrey's Bay (AIM; AMS; NMV; SDMNH); Port Elizabeth; Cape Colony; Pondonland (all SDMNH); Albany; near Grahamstown, Port Alfred; Hermansdorp, Jeffrey's Bay; Cape of Good Hope; N. of Bashee river mouth, 32°10'S & 28°55'E (all USNM); Port Alfred, 33°36'S & 26°54'E; Coffee Bay, Transkei, 31°59'S & 29°09'E (both AMS); Betty's Bay (NMV).

Kilburn (1972) correctly pointed out the chronological priority of *Demoulia ventricosa* (Lamarck, 1816) over *Buccinum retusum* Lamarck, 1822. The type-figure of *D.ventricosa* from Lamarck (1816) is an excellent illustration of the slender cylindrical form of the species (pl.46, fig.6). For further discussion see under *D.ventricosa nataliae.*

Demoulia ventricosa nataliae Kilburn, 1972
(Plate 46, fig.9)

1972. *Demoulia ventricosa nataliae* Kilburn, Ann.Natal Mus. 21:419, textfig. 7c.

"Globose, body whorl well rounded, aperture ovate; labrum evenly rounded, not or barely flattened above, base rather patulous. Spire markedly more exserted than in *v.ventricosa*, and apex is not mamillate. Base of columella with coarse denticles. Ground colour usually orange-pink, the mottled brown form so common in the nominate subspecies, being rare. As a rule rather smaller in size than *v.ventricosa*". (Original description).

TYPE LOCALITY. Durban, Natal, South Africa.

DISTRIBUTION. From Pondonland to Natal and probably Zululand, South Africa. Habitat unknown.

Type specimens. The holotype of *D.ventricosa nataliae* Kilburn, is in the Natal Museum, Pietermaritzburg, No.6407, length 21.0 mm, width 15.0 mm.

Literature records. SOUTH AFRICA: Umkomaas; Clansthal; Scottburgh; Park Rynie; Kelso; Sezela; Port Shepstone; Mzamba; Pondoland (all Kilburn 1972).

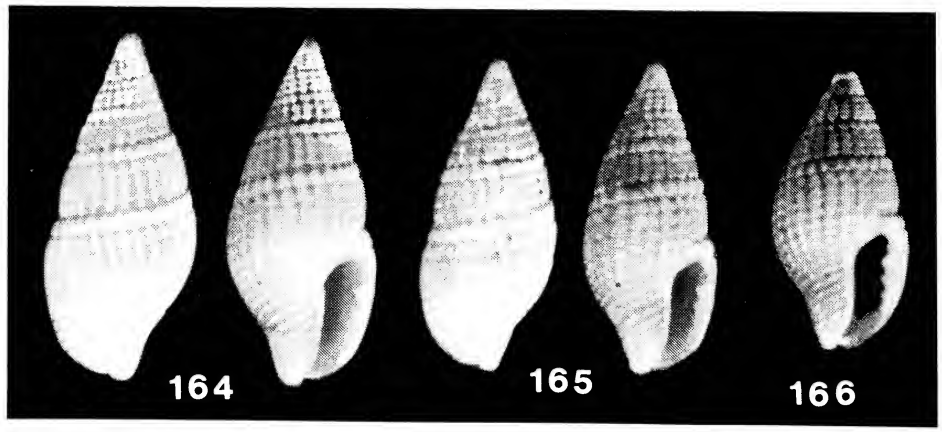
When proposing the new subspecies, Kilburn (1972) stated that in Pondoland, the nominate subspecies is replaced by the more globose, warm-water subspecies *nataliae*. He further argued that the zone of overlap in the Transkei-Pondoland region is so narrow that the variation cannot be regarded as clinal. The absence of any geographical or benthic separation or any other barrier between the two subspecies, and the occurence of intergrading individuals from Nthlonyane, Coffee Bay and Umngazi, make the validity of *nataliae* as a subspecies suspect.

INDO-PACIFIC SPECIES EXCLUDED FROM THE NASSARIINAE

Buccinum aurantium Lamarck, 1822 (Figs.164-166)

1822. *Buccinum aurantium* Lamarck, Hist.nat.anim.s.vert. 7:275 (No locality); 1834 Kiener, Spéc.gen.icon.coq.viv. 9:50, pl.25,fig.101.

Fourteen syntypes are in the Museum d'Histoire Naturelle, Geneva, No.1452/95. The species belongs in the family Columbelidae but it remains unlocalised.



Figs. 164-166. *Buccinum aurantium* Lamarck. Syntypes Museum d'Histoire Naturelle, Geneva, No. 1452/95. 164. 7.2 mm. 165. 6.9 mm. 166. 6.0 mm (= Family Columbellidae).

Nassa becki Turton, 1932

1932. *Nassa becki* Turton, Mar.shells Pt.Alfred p.59, pl.13,fig.432 (Pt.Alfred, Sth. Africa).

This small, 7.0 mm long juvenile specimen with a produced, unformed siphonal canal has more features of a juvenile *Afrocominella*, family Buccinidae, than *Nassarius*. Neither Barnard (1959) nor Kensley in Barnard (1974) were able to suggest what Turton's species really is.

Nassa (Tritiaria) cingulata Hutton, 1885

1885. *Nassa (Tritiaria) cingulata* Hutton, Trans.Proc.N.Z.Inst. 17:327 (Greta, Canterbury, New Zealand, Pliocene); 1926 Finlay, Trans.Proc.N.Z.Inst. 56:239 (as *Zephos*).

This New Zealand species belongs in the Buccinidae and is the type-species of *Zephos* Finlay, 1926.

Nassa (Hima) colpophora Cossmann, 1903

1903. *Nassa (Hima) colpophora* Cossmann, J.Conchyl. 51:140, pl.5,figs.6,7 (Karikal, Pliocene of India); 1924 Vredenburg, Rec.Geol.Surv.India 55:73.

This species from the Indian Pliocene belongs to *Phos* Montfort, family Buccinidae.

Nassarius (Niotha) fijiensis Ladd, 1977

1934. *Phos vitiensis* Ladd, Bern.P.Bishop Mus.Bull. 119:226, pl.40,fig.6 (St.165, Wailoa River, Nasogo, Viti Levu, Late Miocene of Fiji).

1977. *Nassarius (Niotha) fijiensis* Ladd, U.S.Geol.Surv.Prof.Pap. 553:54, pl.18,figs.3,4 (nom.subst.pro *Phos vitiensis* Ladd, 1934).

1980. *Phos (Philindophos) vitiensis* Ladd, Cernohorsky, Rec.Auckland Inst.Mus. 16:177, figs.19,20.

The replacement name *Nassarius fijiensis* Ladd, 1977, for *Phos vitiensis* Ladd, 1934, was superfluous, since the Fijian Miocene species belongs to the genus *Phos*, subgenus *Philindophos* Shuto, 1969, family Buccinidae (see Cernohorsky 1980).

Nassa francoindica K.Martin, 1919

1919. *Nassa franco-indica* K.Martin, Palaeozool.Kennt.Java, p.119 (nom.subst.pro *Nassa ovum* Cossmann, 1903) [Karikal, Pliocene of India].

This is a substitute name for *Nassa ovum* Cossmann, 1903, from the Indian Pliocene, which is a juvenile *Casmaria,* family Cassidae.

Arcularia grandior Verco, 1908

1908. *Arcularia grandior* Verco, Trans.R.Soc.Sth. Australia 32:344, pl.15, figs.16,17 (off Beachport, Sth. Australia, 183-266 m).

1959. *Fax grandior* (Verco), Cotton, Sth. Australian Moll. p.382.

This South Australian deep water species is a member of *Fax* Iredale, family Buccinidae.

Nassa (Hinia) ickei K.Martin, 1914

1914. *Nassa (Hinia) ickei* K.Martin, Samml.geol.Reichs-Mus.Leiden,N.S. 2:143, pl.3,figs.86a,b 87 (Kali Puru, Nanggoelan beds, U.Eocene of Java, Indonesia; c.15.0 mm).

This Indonesia Eocene species has *c.* 16 prominent lirae on the wall of the outer lip, small, close-set non-nassarid oblique folds on the anterior of the columella and a prominent photine fasciolar cord which starts at the posterior-most denticle and continues to the dorsal side where it connects to the anterior canal. No Nassariinae are known from Eocene deposits and the specis clearly belongs to the Photinae, family Buccinidae.

Nassa incisa (Hutton, 1887) [= 1885]

1885. *Clathurella incisa* Hutton, Trans.Proc.N.Z.Inst. 17:328 (Te Aute, Hawke's Bay, ? Pliocene of New Zealand).

1887. *Nassa incisa* Hutton, Proc.Linn.Soc.N.S.W. 1:210.

1966. *Zephos incisa* (Hutton), Fleming, N.Z. Dept.Sci.Ind.Res.Bull. no.173:62.

Originally described as *Clathurella incisa* Hutton, 1885, it was later transferred to the genus *Nassa*. This species is neither turrid nor nassarid and belongs to *Zephos* Finlay, family Buccinidae.

Nassa iwakiana Yokoyama, 1931

1931. *Nassa iwakiana* Yokoyama, J.Fac.Sci.Imp.Univ.Tolyo 3:200, pl.12,figs.7ab; 8a,b (Iwaki, N.E.Honshu, Japan, U.Miocene).

According to Oyama (1961) the species is a synonym of *Antilophos (Coraeophos) nakamurai* (Kuroda in Homma, 1931) family Buccinidae.

Nassa (Hinia) karikalensis Cossmann, 1903

1903. *Nassa (Hinia) karikalensis* Cossmann, J.Conchyl. 51:139, pl.5,figs.16,17 (Karikal, Pliocene of India); 1924 Vredenburg, Rec.Geol.Surv.India 55:74.

This Indian Pliocene species is a buccinid which would be appropriately assigned to *Phos*, subgenus *Coraeophos* Makiyama, 1936.

Nassarius kikaizimanus Nomura & Zinbo, 1934

1934. *Nassarius kikaizimanus* Nomura & Zinbo, Sci.Repts.Tohoku Imp.Univ. (2), Geology, 16:160, pl.5fig.27 (Kikai-zima, Ryukyu Is, Pleistocene).

This species does not belong to the Nassariidae and should be assigned to the Photinae, family Buccinidae.

Nassa (?) lamonganana K.Martin, 1884

1884. *Nassa (?) lamonganana* K.Martin, Samml.geol.Reichs-Mus.Leiden (1), 3:125, pl.7,fig.128 (Tambuk Batu, Java, Miocene of Indonesia).

The incomplete, *c.* 43.0 mm long specimen of *N.lamonganana* is sufficiently well preserved to be recognisable as a species of *Distorsio,* family Cymatiidae.

Nassa litorafontis Carrington & Kensley, 1969

1969. *Nassa litorafontis* Carrington & Kensley, Ann.Sth. African Mus. 52(9):195, pl.18,fig.b (Strandfontein, Namaqualand coast, Sth. Africa, Pleistocene).

This South African species is not nassarid and is most probably a member of *Afrocominella* Iredale, family Buccinidae.

Nassarius (? Niotha) metuliformis MacNeil, 1960

1960. *Nassarius (? Niotha) metuliformis* MacNeil, U.S.Geol.Surv.Prof.Pap. no.339:80, pl.3,fig.29 (Yonabaru clay, Okinawa, Ryukyu Is, Miocene).

1980. *Phos metuliformis* (MacNeil), Cernohorsky, Rec.Auckland Inst.Mus. 16:177, fig.16 (illustrated holotype).

The author compared his species with the buccinid genera *Metula* and *Phos*, but finally assigned the species to *Nassarius*. The species actually belongs to the *Phos* group, family Buccinidae. The holotype is in the National Museum of Natural History, Washington, No. USNM-562704, length 15.0 mm, width 6.4 mm.

Nassarius nakamurai Kuroda in Homma, 1931

1931. *Nassarius nakamurai* Kuroda in Homma, Geol.Cent.Shinano Ueda, Pt.4:82, pl.12,figs.97,98 (Aoki, Central Shinano, Japan, L.Miocene).

According to Oyama (1961) the species belongs to *Antillophos*, subgenus *Coraeophos* Makiyama, family Buccinidae.

Nassa nanggulanensis K.Martin, 1914

1914. *Nassa nanggulanensis* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S., 2:143, pl.3,figs.88,89 (Kali Puru and Kali Songo, Nanggolean beds, Java, U.Eocene of Indonesia).

The type specimen of *N.nanggulanensis* has the aperture imbedded in matrix which makes recognition of its familial affinities impossible. Since clearly recognisable Nassariinae are known only from the Lower Miocene and younger deposits, the species probably belongs to the Buccinidae.

Nassa ovum Cossmann, 1903

1903. *Nassa ovum* Cossmann, J.Conchyl. 51:138, pl.4,figs.25 (Karikal, Pliocene of India); 1924 Vredenburg, Rec.Geol.Surv.India 55:73 (non K.Martin, 1880).

1919. *Nassa franco-indica* K.Martin, Paleozool.Kennt.Java, p.119 (nom.subst.pro *N.ovum* Cossmann, 1903).

This non-nassarid Indian Pliocene species is a juvenile cassid which is most probably conspecific with *Cassis (Casmaria) bonneti* Cossmann, 1903, from the same deposits. *Nassa ovum* Cossmann is a primary homonym of *N.ovum* K.Martin, 1880.

Soyonassa porifericola Okutani, 1964

1964. *Soyonassa porifericola* Okutani, J.Fac.Sci.Univ.Tokyo, Sect.II, 15:406, pl.5,fig.10 (off Hachijo I, Japan).

This species is certainly not nassarid and appears to belong to the Rissoacea.

Nassa prolongata Turton, 1932

1932. *Nassa prolongata* Turton, Mar.shells Pt.Alfred p.55, pl.12,fig.411 (Pt.Alfred, Sth. Africa).

This very worn specimen with a missing apex is not nassarid but closely resembles a *Clionella*, family Turridae.

Nassa rhysonepia Barnard, 1969

1969. *Nassa rhysonepia* Barnard, Ann.Sth. African Mus. 47(4):627, textfig.15a (off Cove Rock, East London, Sth. Africa, 40 m; Cape Infant, 84 m, etc.); 1974 Kensley in Barnard, Ann.Sth. African Mus. 47(5):684.

1975. *Seilopsis peilei* (E.A.Smith), Kilburn, Ann.Natal Mus. 22(2):581, fig.3b.

The holotype in the South African Museum, Cape Town, No. A-29990, is a minute juvenile which is according to Kilburn (1975) conspecific with *Seilopsis peilei* (E.A.Smith, 1910), family Cerithiidae.

Nassa seminulum Tapparone-Canefri, 1875 (Fig.168)

1875. *Nassa seminulum* Tapparone-Canefri, Ann.Mus.Civ.Stor.Nat.Genoa 7:1029 (Kei Bandan = Kai Banda, Moluccas, Indonesia).

A 4.0 mm specimen labelled *N.seminulum* by Tapparone-Canefri is in the collection of the Museo Civico di Storia Naturale, Genoa. The specimens is conspecific with *Planaxis lineatus* (da Costa, 1776), family Planaxidae.

Nassa semitexta Hedley, 1899

1899. *Nassa semitexta* Hedley, Mem.Austral.Mus. 3:462, textfig.37 (Funafuti, Ellice Is).

1907. *Tritonidea seurati* Couturier, J.Conchyl. 55:137, pl.2,figs.1-3 (Hao, Tuamotu Archipelago).

1975. *Isselia semitexta* (Hedley), Cernohorsky, Rec.Auckland Inst.Mus. 12:224, figs.30-34 (figd.types).

This minute white species, originally described from the Ellice Islands and later recorded from Queensland, Australia and the Tuamotu Archipelago, is not nassarid but is an *Isseliella* Weinkauff, 1881, family Rissoinidae.

Nassa subcancellata Turton, 1932

1932. *Nassa subcancellata* Turton, Mar.shells Pt.lfred p.57, pl.13,fig.424 (Pt.Alfred, Sth. Africa).

Barnard (1959) suggested that this small, worn and white, 11.0 mm long specimen was a synonym of *Nassa plebecula* Gould (= *Nassarius pauperus* Gould). It certainly is not the latter species and could be either a worn columbellid or turrid.

Nassa varians Dunker, 1860 (Fig.167)

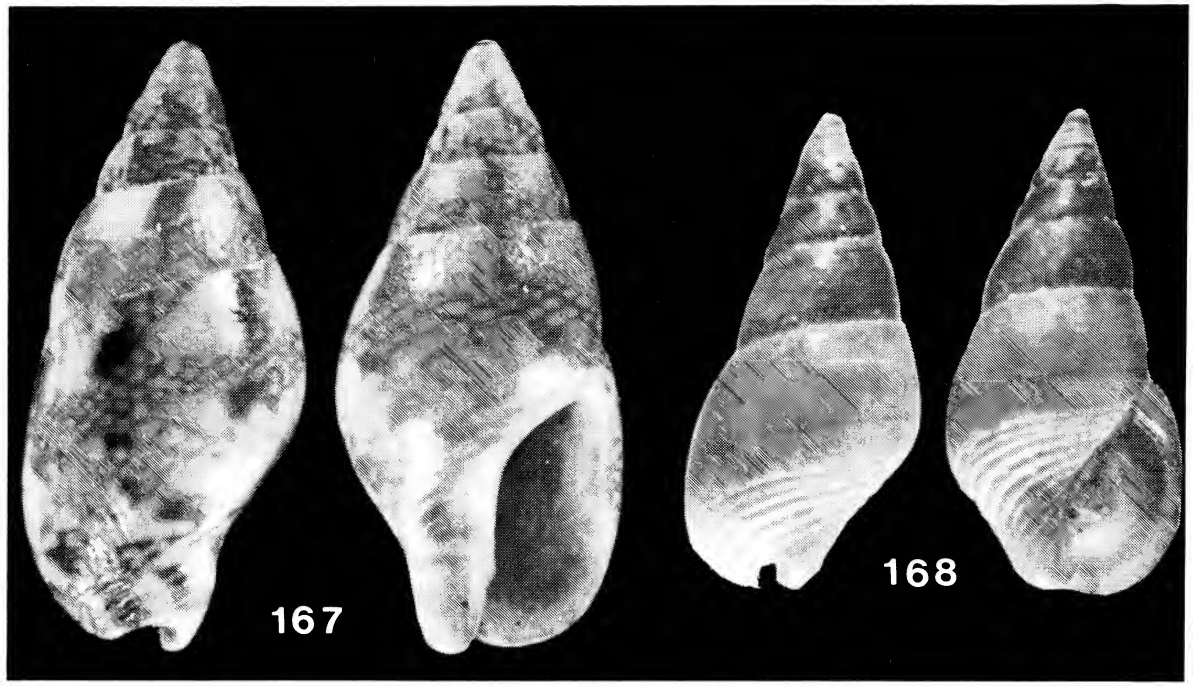
1860. *Nassa varians* Dunker, Malakozool.Blaetter 6:231 (Dejima, Japan) [non *Columbella varians* Sowerby, 1832].
1860. *Columbella (Amycla) bicincta* Gould, Proc.Boston Soc.Nat.Hist. 7:335 (Hong Kong).
1860. *Columbella (Amycla) lineolata* Gould, *ibid.*, 7:335 (Hong Kong) [non Kiener, 1841].
1860. *Columbella (Amycla) araneosa* Gould, *ibid.*, 7:336 (Kagoshima Bay, Japan) [non Kiener, 1841].
1861. *Amycla varians* (Dunker), Dunker, Moll.Japonica p.6, pl.1,fig.17.
1883. *Columbella (Mitrella) dunkeri* Tryon, Man.Conch. 5:129, pl.49,fig.15 (nom.subst.pro *Nassa varians* Dunker, 1860).

The immature holotype of *N.varians* Dunker, is in the Zoological Museum, Humboldt University, Berlin, length 9.3 mm, width 4.5 mm. It is a synonym of *Mitrella bicincta* (Gould), 1860), family Columbellidae.

Buccinum vicaryi d'Archiac & Haime, 1854

1850. *Cancellaria vicaryi* d'Archiac, Soc.Geol.France 3:291 (Nom.nud.).
1854. *Buccinum vicaryi* d'Archiac & Haime, Desc.anim.foss.numm.l'Inde, p.318, pl.31,figs.14a,b (Chaine d'Hala, Gaj of Sind, Miocene of India).
1924. *Nassa (Hima) vicaryi* (d'Arch.& H.), Vredenburg, Mem.Geol.Surv.India 50:212.

The authors have compared the species to the Cancellariidae but Vredenburg (1925) placed it in *Nassa,* subgenus *Hima*. Judging from the figures and description, the species probably does belong in the family Cancellariidae.



Figs. 167,168. 167. *Nassa varians* Dunker. Immature holotype ZMHU; 9.3 mm. (= Family Columbellidae). 168. *Nassa seminulum* Tapparone-Canefri. Specimen from Tapparone-Canefri's collection, Museo Civico Storia Naturale, Genoa; 4.0 mm. (= Family Planaxidae).

DUBIOUS INDO-PACIFIC SPECIES OF NASSARIINAE

Buccinum acutimargo Philippi, 1851

1851. *Buccinum acutimargo* Philippi, Zeit.f.Malakozool. 8:55 (China).

The species was compared by the author to the European Mio-Pliocene fossil *Nassarius turbinellus* (Brocchi, 1814). The species has not been illustrated and the type came from the collection of Largilliert, which is no longer traceable.

Nassa attenuata Gray, 1839

1839. *Nassa attenuata* Gray, Zool.Capt.Beechey's Voy. p.127 (Pacific Ocean).

The species has not been illustrated and the three-line description would indicate a species similar to *Nassarius luridus* (Gould, 1850). The type is lost and the species is considered unrecognisable.

Buccinum bicolor Philippi, 1851

1851. *Buccinum bicolor* Philippi, Zeit.f.Malakozool. 8:56 (No locality) [non Megerle, 1824].

The author compared his species with the European *Nassarius incrassatus* (Stroem, 1768). The type is lost and the species is unrecognisable from the description. It is a primary homonym of *Buccinum bicolor* Megerle, 1824.

Buccinum birmanicum Philippi, 1851

1851. *Buccinum birmanicum* Philippi, Zeit.f.Malakozool. 8:57 (Birman, Mergui Archipelago).

The author compared his species with *Fusus* and with *Buccinum ambiguum* (Pulteney, 1799), which is a *Nassarius*. The type is lost and the species is unrecognisable.

Nassa caerulea Marrat, 1880.

1880. *Nassa caerulea* Marrat, Var.shells genus *Nassa* pp.76,81 (No locality); 1940 Tomlin, Proc.Malac. Soc.Lond. 24:35.

The types are lost and the species is unrecognisable from the description.

Buccinum caperatum Philippi, 1849

1849. *Buccinum caperatum* Philippi, Abb.Beschr.Conchyl. 3:68, pl.2,fig.18 (No locality).

The species has been described from unknown locality and the type cannot be found. Although the species has been described and illustrated by Philippi (1847-51), I am unable to associate the taxon with any particular species.

Buccinum cecillii Philippi, 1848

1848. *Buccinum cecillii* Philippi, Zeit.f.Malakozool. 5:27 (Manila, Philippines).

The author compared his species with the European *Buccinum marginulatum* Lamarck, 1822 (= *Nassarius mutabilis* Linnaeus, 1758). The type is lost and the species remains unrecognisable.

Buccinum chinense Philippi, 1851

1851. *Buccinum chinense* Philippi, Zeit.f.Malakozool. 8:57 (Liew-Kiew, China) [non Dillwyn, 1817].

The author compared his species with *Nassarius afer* (Philippi, 1851). The species is unrecognisable from the description, and the type ex-coll. Largilliert is no longer traceable. The taxon is a primary homonym of *Buccinum chinense* Dillwyn, 1817.

Zeuxis clandestina A.Adams, 1870

1870. *Zeuxis clandestina* A.Adams, Ann.Mag.Nat.Hist. (4), 5:426 (Seto-Uchi, Idsuma-Na, Yobuko, Japan).

The species has not been illustrated, the type is lost and the species is not recognisable from the description. Tryon (1882) tentatively placed it in synonymy of *Nassarius gaudiosus* (Hinds, 1844).

Buccinum corruscans Philippi, 1851

1851. *Buccinum corruscans* Philippi, Zeit.f.Malakozool. 8:58 (Bali, Indonesia).

The author compared his species with *Nassarius foveolatus* (Dunker, 1847). The type, ex-coll. Largilliert, could not be traced and the species remains unrecognisable.

Nassa crassicostata Marrat, 1880

1880. *Nassa crassicostata* Marrat, Var.shells genus *Nassa* pp.45,82 (Bombay, India); 1940 Tomlin, Proc.Malac.Soc.Lond. 24:35 (non Marrat, 1877).

The species was said to be intermediate in characters between *Nassarius nodifer* (Powys) and *N.costatus* (A.Adams). The type is lost and the species remains unrecognisable.

Buccinum crenulatum Bruguiere, 1789

1789. *Buccinum crenulatum* Bruguière, Encycl.Méth.Hist.nat.vers 1:271 (No locality).

The identity of Bruguière's species has never been satisfactorily solved since his only reference accompanied by a query was to "Petiver, plate 64, fig.8". This particular illustration has been cited by Linnaeus (1767) for the Mediterranean species *Nassarius reticulatus* (Linnaeus, 1758), which it was said to resemble. Many recent authors have applied the taxon to the species *N.castus* (Gould, 1850) or *N.siquijorensis* (A.Adams, 1852). Bruguière's taxon is conveniently disposed of as a primary homonym of *Buccinum crenulatum* Linnaeus, 1758, a species in the family Terebridae.

Buccinum (Nassa) darwini Dunker, 1853

1853. *Buccinum (Nassa) darwini* Dunker, Zeit.f.Malakozool. 10:95 (No locality).

The author considered his species to be intermediate in characters between *Nassarius corniculus* (Olivi) from the Mediterranean Sea and the Indo-Pacific *N.reeveanus* (Dunker, 1847). The type is lost and the specis is unrecognisable.

Nassarius delislei King, 1935

1935. *Nassarius delislei* King, Trans.Geol.Soc.Sth. Africa 56:79, pl.12, fig.28 (Uloa, Unfolozi River, Lower Miocene of Zululand).

This species from the Miocene of Zululand has been described on the basis of a single, badly preserved specimen with part of the aperture missing. The shell is subglobose and closely sculptured with 35 axial ribs on the body whorl. Being incomplete, it lacks any character which would aid in associating it with the Nassariidae.

Tritia fauroti Jousseaume, 1888

1888. *Tritia fauroti* Jousseaume, Mem.Soc.Zool.France 1:186 (Obock, Red Sea).

The species has not been illustrated and the type can no longer be found. The taxon remains a *nomen dubium*.

Buccinum (Nassa) forbesii Dunker, Zeit.f.Malakozool. 10:60 (No locality).

The author compared his species with *Nassarius hirtus* (Kiener, 1834) but did not illustrate the species. The type is lost, the locality is unknown and the species remains unrecognisable.

Nassa (Alectryon) freyi Brancsik, Trencsen term.egypt. 13:80, fig.? (Nossi Be, Madagascar).

I have not been able to secure the original reference and the entry is from the "Zoological Record" for 1891.

Buccinum glaucum Dunker, 1852

1852. *Buccinum glaucum* Dunker, Zeit.f.Malakozool. 9:125 (Port Essington, Australia) [non Linnaeus, 1767].

The author compared his species with *Nassarius unicolorus* (Kiener, 1834) [= *N.dorsatus* Roeding, 1798]. The type is lost and the species is unrecognisable. Dunker's taxon is a primary homonym of *Buccinum glaucum* Linnaeus, 1767. The type was ex-coll. Gruner, Bremen.

Nassa granulata Fischer von Waldheim, 1807

1807. *Nassa granulata* Fischer v.Waldheim, Museum Demidoff 3:174 (No locality).

The description contains only 6 words, no locality has been cited and the type is no longer traceable. The species remains a *nomen dubium*.

Nassa grata Marrat, 1880

1880. *Nassa grata* Marrat, Var.shells genus *Nassa* pp.45,81 (Canton I and Siam = Thailand); 1940 Tomlin, Proc.Malac.Soc.Lond. 24:36.

The species has not been illustrated, the type is lost and the species remains unrecognisable.

Buccinum hanleyanum Dunker, 1847

1847. *Buccinum hanleyanum* Dunker, Zeit.f.Malakozool. 4:63 (No locality).

The species was compared with *Nassarius haldemanni* (Dunker, 1847) by the author, but has not been illustrated. The type is lost and the species is unrecognisable.

Buccinum herrmannseni Dunker, 1847

1847. *Buccinum herrmannseni* Dunker, Zeit.f.Malakozool. 4:63 (No locality).

The author compared his species with *Nassarius suturalis* (Lamarck, 1822) [= *N.glans* Linnaeus, 1758]. The species has not been illustrated, the type is lost and the species is unrecognisable.

Nassa japonica A.Adams, 1852

1852. *Nassa japonica* A.Adams, Proc.Zool.Soc.Lond. Pt.19:110 (Japan).

E.A.Smith (1879a) reported Adams' type of *N.japonica* as lost and considered the original description as far too brief for the identification of the species. Japanese authors associate *Nassarius japonicus* (A.Adams) with the species *N.tenuis* (E.A.Smith, 1879) [= *N.praematuratus* Kuroda & Habe], but Adams' description could equally as well represent *N.fuscolineatus* (E.A.Smith, 1875) or even *N.pauperus* (Gould, 1850). I was unable to trace the tye of *Nassa japonica* in the British Museum (N.H.), and the taxon is therefore considered a *nomen dubium*.

Buccinum kieneri Anton, 1838

1838. *Buccinum kieneri* Anton, Verz.Conchyl. p.92 (No locality).

Kaicher (1957) applied the taxon *Nassarius kieneri* (Anton) to the common Indo-Pacific species *N.luridus* (Gould, 1850). Anton's types are no longer extant and his description, which lacks an illustration, is far too brief and only sufficient to recognise the species as a *Nassarius*. The taxon is considered to be an unidentified nassarid species.

Buccinum laetum Philippi, 1849

1849. *Buccinum laetum* Philippi, Zeit.f.Malakozool. 5:140 (No locality).

The author compared his species with the Mediterranean *Nassarius mutabilis* (Linnaeus, 1758), but the species has not been illustrated. The type, ex-coll. Reents, Hamburg, is no longer traceable and the species is considered to be unrecognisable.

Nassa laevis Fischer von Waldheim, 1807

1807. *Nassa laevis* Fischer v.Waldheim, Museum Demidoff 3:174 (No locality).

The description is extremely brief and generalised, no references or locality has been cited and the type is no longer traceable. The species remains a *nomen dubium*.

Alectrion (Tritia) latecostata Suter, 1917

1917. *Alectrion (Tritia) latecostata* Suter, N.Z.Geol.Surv.Palaeont.Bull. 5:36, pl.1,fig.8 (Pukeuri near Oamaru, L.Miocene of New Zealand).

1966. *Nassarius latecostatus* (Suter), Fleming, N.Z.Dept.Sci.Ind.Res.Bull. No.173:63.

The species cannot be assigned to the Nassariidae with any degree of confidence. The juvenile holotype lacks any diagnostic features which would aid in associating it with the Nassariidae, but it closely resembles juvenile specimens of some Miocene buccinid species, particularly those of *Austrofusus* Kobelt. I consider *Alectrion latecostata* a *species inquirenda*, but should it be confirmed as a *Nassarius,* then it would become a secondary homonym of *Nassa laticostata* Marrat, 1877, and *N.laticostata* Sacco, 1904 [Art.58(8) of ICZN].

Nassa laticostata Marrat, 1877

1877. *Nassa laticostata* Marrat, Prop.new forms genus *Nassa* p.12 (No locality); 1940 Tomlin, Proc.Malac.Soc.Lond. 24:36.

The species has not been illustrated, the locality is unknown and the type is lost. The species is unrecognisable.

Buccinum limicola Philippi, 1851

1851. *Buccinum limicola* Philippi, Zeit.f.Malakozool. 8:59 (China).

The author compared his species with *Nassarius incrassatus* (Stroem, 1768) from Europe, but he did not illustrate the species. The type, ex-coll. Largilliert, cannot be traced and the species is considered unrecognisable.

Nassa lucida Marrat, 1874

1874. *Nassa lucida* Marrat, Ann.Mag.Nat.Hist. (4), 13:70 (Keeling Is = Cocos Keeling Is, Indian Ocean); 1940 Tomlin, Proc.Malac.Soc.Lond. 24:37.

The types are lost and the description is insufficient to identify the species.

Buccinum noduliferum Philippi, 1849

1849. *Buccinum noduliferum* Philippi, Zeit.f.Malakozool. 5:136; 1849 Philippi, Abb.Beschr.Conchyl. 3:42, pl.1,fig.3 (Northern China).

The type could not be located and the species cannot be unequivocally identified. The illustration bears a resemblance to *N.fraterculus* (Dunker, 1860), a species known from Korea and Japan.

Nassa obliquata A.Adams, 1852

1852. *Nassa obliquata* A.Adams, Proc.Zool.Soc.Lond. Pt.19:105 (Cagayan, Misamis Province, Mindanao I, Philippines, 46 m) [non *Buccinum obliquatum* Brocchi, 1814 = *Nassarius*].

The type could not be found and the species is unrecognisable from the three-line description. The taxon is also a secondary homonym of the Italian Pliocene *Nassarius obliquatus* (Brocchi, 1814).

Nassa pediculina Gould, 1860

1860. *Nassa pediculina* Gould, Proc.Boston Soc.Nat.Hist. 7:332 (Kong Kong Harbour, China); 1882 Tryon, Man.Conch. 4:63; 1964 Johnson, U.S.Nat.Mus.Bull. No.239:124.

The species has never been illustrated and is unrecognisable from the description alone. Tryon (1882) treated *pediculina* as an undetermined species, and Johnson (1964) was unable to trace the type-lot originally marked USNM-529.

Buccinum pingue Philippi, 1851

1851. *Buccinum pingue* Philippi, Zeit.f.Malakozool. 8:61 (Bali, Indonesia).

The author compared his species with *Nassarius jonasii* (Dunker, 1846) and *N.burchardi* (Dunker in Philippi, 1849). The type, ex-coll.Largilliert, is no longer traceable and the species remains unrecognisable.

Nassa plicatella Gould, 1862

1862. *Nassa plicatella* Gould, Proc.Boston Soc.Nat.Hist. 8:280 (British Burma) [non A.Adams, 1852].

The species remains undetermined and the type has been either destroyed by fire or lost. Gould's taxon is a primary homonym of *Nassa plicatella* A.Adams, 1852.

Buccinum quisquilarum Philippi, 1851

1851. *Buccinum quisquilarum* Philippi, Zeit.f.Malakozool. 8:62 (China).

The type ex-coll. Largilliert cannot be traced and the species is not recognisable from the description alone.

Nassa reposta Gould, 1860

1860. *Nassa reposta* Gould, Proc.Boston Soc.Nat.Hist. 7:331 (? Sydney, New South Wales, Australia); 1878 Tenison-Woods, Proc.Linn.Soc.N.S.W. 2:257; 1913 Hedley, Proc.Linn.Soc.N.S.W. 38:318.

Although Tenison-Woods (1878) thought that Gould's specimens may be a variety of *Nassarius pauperatus* (Lamarck, 1822), Hedley (1913) proposed that the name be abandoned as he was unable to locate the type in any of the Museums. *N.reposta* remains unrecognisable.

Nassa rugosa Marrat, 1877

1877. *Nassa rugosa* Marrat, Prop.new forms genus *Nassa* p.5 (No locality); 1940 Tomlin, Proc.Malac.Soc.Lond. 24:38 (non *Buccinum rugosum* J. de C.Sowerby, 1815 = *Nassarius*).

This species from unknown locality has not been illustrated, the type is lost and its identity remains undetermined. The taxon is a secondary homonym of *Buccinum rugosum* J. de C.Sowerby, 1815 (= *Nassarius reticosus* J. de C.Sowerby, 1815).

Nassa savignyi Pallary, 1926

1926. *Nassa savignyi* Pallary, Mem.Inst.Egypte 11:87 (ref. to Savigny, 1817, Desc.de l'Egypte, Atlas, pl.6,fig.3) [Red Sea]; 1982 Bouchet & Danrigal, Nautilus 96(1):15, fig.90.

The type is lost and it is difficult to interpret the type-figure which may possibly represent an immature individual of *Nassarius albescens gemmuliferus* (A.Adams, 1852).

Buccinum (Nassa) sculptum Dunker, 1853

1853. *Buccinum (Nassa) sculptum* Dunker, Zeit.f.Malakozool. 10:96 (No locality).

The author compared his species to "*Buccinum crenulatum* Bruguière" and *Nassarius livescens* (Philippi, 1849). The type is lost and the species is unrecognisable from the description alone.

Nassa subsimilis E.A.Smith, 1906

1906. *Nassa subsimilis* E.A.Smith, Ann.Mag.Nat.Hist. (7), 18:165 (St.244, off the west coast of India, 14°31'15"N & 73°10'E, 218-227m).

The species has not been illustrated and the type is lost. The author compared his species to *N.ravida* (= *ranida*) A.Adams, 1852, and to *N.eucomista* Melvill & Standen, 1897, both of which are forms of *N.crematus* (Hinds, 1844). The species is unrecognisable from the description alone.

Nassa tessellata Reeve, 1853

1853. *Nassa tessellata* Reeve, Conch.Icon. 8:pl.25, figs.167a,b, 170 (No locality); 1932 Tomlin, Proc.Malac.Soc.Lond. 20:97.

The types appear to be lost but several authors have suggested that *Nassarius tessellatus* is a variety of the Caribbean *N.vibex* (Say, 1822). The type-figures of *N.tessellatus* closely resemble the species *N.vibex*.

Buccinum verrucosum Gmelin, 1791

1791. *Buccinum verrucosum* Gmelin, Syst.Nat. ed.13:3497 (No locality) [non Bruguière, 1789].

Gmelin (1791) cited a figure from "Gualtieri, 1842, pl.43, fig.M" for his *Buccinum verrucosum*, and this illustration closely resembles immature specimens of the Indo-Pacific species *N.conoidalis* (Deshayes in Bélanger, 1832). Gmelin's taxon, however, is a primary homonym of *Buccinum verrucosum* Bruguière, 1789.

Subfamily **CYLLENINAE** Bellardi, 1882

1882. *Cylleninae* Bellardi, Mem.R.Accad.Sci.Torino (2), 34:161.

GEOGRAPHICAL DISTRIBUTION. Recent in the tropical Indo-Pacific, S.E. Australia and West Africa. Fossil in Europea and Asia.

STRATIGRAPHICAL RANGE. Miocene to Recent.

The subfamily contains only 2 genus-groups, i.e. the genus *Cyllene* Gray in Griffith & Pidgeon, which is known living from West Africa and the tropical Indo-West Pacific and fossil from Europe and Asia, and the subgenus *Cyllenina* Bellardi, known only from Mio-Pliocene deposits of Western Europe.

WORLD-WIDE SPECIES OF CYLLENINAE

Genus **Cyllene** Gray in Griffith and Pidgeon, 1834

Cyllene Gray in Griffith & Pidgeon, 1834, Anim.Kindg.Cuvier, Moll.& Rad. 12:597. Type species by M *C.owenii* Gray in Griffith & Pidgeon, 1834. Recent, West Africa.

1924. *Radulphus* Iredale, Proc.Linn.Soc.N.S.W. 49(3):270. Type species by M *R.royanus* Iredale, 1924. Recent, S.E. Australia.

Shell up to 20.0 mm in length, solid, with a short spire and long body whorl, sculptured with axial ribs and spiral threads; aperture elongate and narrow, outer lip thick, interior prominently lirate, columella calloused and distinctly plicate, suture above outer lip grooved, siphonal notch deep, anal canal shallow, parietal denticle absent, anterior edge of outer lip with a distinct or shallow stromboid notch. Operculum brown, elongated and pointed, simple at margins.

Radula with a nassariine type of rachidians, with *c.* 15 denticles, laterals modified, consisting of a long and slender outer cusp and a stunted inner cusp which appears in the form of a small, trigonal protrusion (fig. 173).

GEOGRAPHICAL DISTRIBUTION. West Africa, tropical Indo-West Pacific and S.E. Australia.

STRATIGRAPHICAL RANGE. Miocene to Recent.

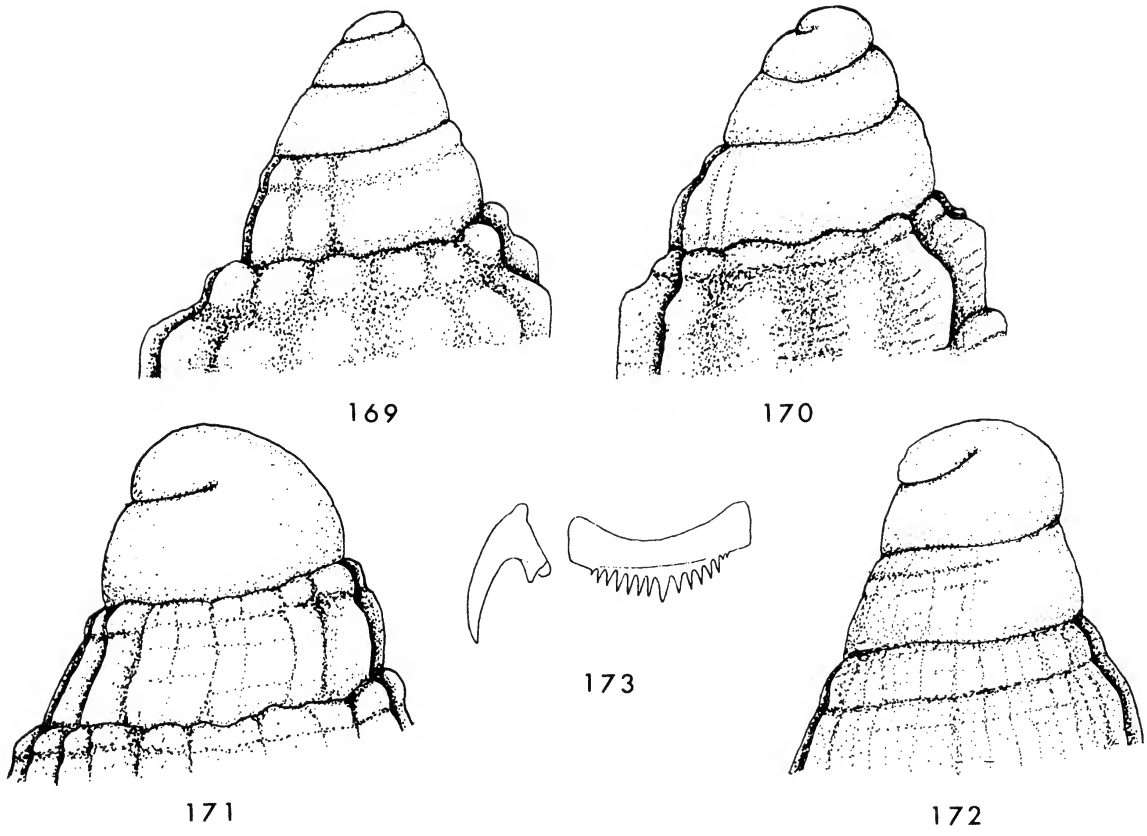
Species of *Cyllene* are easily separated from the superficially similar buccinid genera *Phos* and *Cominella* by the presence of a olivid-type sutural groove above the outer lip, and the obliquely plicate columellar callus.

Tournouer (1875) claimed that the genus *Cyllene* was known only from Miocene deposits, but Cossmann (1901) reported *C.desnoyersi* (Basterot), from Plaisancian Pliocene of Piemont on the authority of Bellardi (1882). During Miocene times *Cyllene s.str.* species were already established in Burma, Indonesia and the Ryukyu Islands, whereas species of the subgenus *Cyllenina* Bellardi, appear to be confined to Mio-Pliocene deposits of Western Europe.

Nuttall & Cooper (1973) erroneously stated that species of *Cyllene* are known only from shallow water. Actually the opposite is the case, since *Cyllene* species are rarely found in shallow water, and most species live subtidally. *Cyllene sibogae* Schepman, for example, is known only from depth of 296-350 m.

The range of variability in *Cyllene* species is still largely unknown, due to the paucity of more extensive research material in Museums and private collections. Some species, e.g. *C.fuscata* A.Adams, and *C.pulchella* Adams & Reeve, are the only two Indo-Pacific species where several dozen specimens were available for examination, while all other *Cyllene* species were represented by only a few individuals. It is quite possible that "species" have been accepted as valid which may prove on re-evaluation to be only forms of other species, once more comparative material becomes available.

Cyllene s.str. contains 14 Recent species and 5 fossil Indo-Pacific species.



Figs. 169-173. Protoconchs and radula of Cylleninae. 169. *Cyllene fuscata* A.Adams. 170. *C.sibogae* Schepman. 171. *C.sulcata* Sowerby. 172. *C.royana* (Iredale). 173. Half-row of radula of *C.desnoyersi lamarcki* Cernohorsky (from Thiele, 1929, fig.373 — as *lyrata* Lamarck).

Cyllene desnoyersi lamarcki Cernohorsky, 1975
(Plate 47, figs.1-3)

1822. *Buccinum lyratum* Lamarck, Hist.nat.anim.s.vert. 7:272; 1834 Kiener, Spec.gen.icon.coq.viv. 9:38, pl.22,fig.88; 1844 Deshayes & Edwards, Hist.nat.anim.s.vert. ed.2, 10:170 (non *B.lyratum* Gmelin, 1791).
1851. *Cyllene lyrata* (Lamarck), A.Adams, Proc.Zool.Soc.Lond. Pt.18:205; 1853 Petit de la Saussaye, J.Conchyl. 4:145; 1858 H. & A.Adams, Gen.Rec.Moll. 3:pl.13,fig.2; 1877 Kobelt, Jahrb.deut.Malak.Gesell. 4:298; 1881 Tryon, Man.Conch. 3:223, pl.84,figs.555-557; 1912 Dautzenberg, Ann.l'Inst. Monaco 5:29; 1929 Thiele, Dandb.syst.Weicht. 1:326,fig.373 (radula), fig.374 (shell); 1956 Knudsen, Atlantide Rept. No.4:59; 1968 Nordsieck, Europ.Meeres-Gehausesch. 1:144, pl.23,fig.81.80.
1859. *Cyllene lyratum* Lamarck, Chenu, Man.Conchyl. 1:161, fig.757.
1875. *Cyllene lirata (sic)* Lam., Tournouer, J.Conchyl. 23:335, pl.15,fig.5 (shell), figs.5a,b (operculum).
1943. *Cyllene (Cyllene) lyrata* (Lamarck), Wenz, Handb.Palaeozool. 6:1239, fig.3532.
1975. *Cyllene desnoyersi lamarcki* Cernohorsky, Rec.Auckland Inst.Mus. 12:168, fig.92 (nom.subst.pro *Buccinum lyratum* Lamarck, 1822).

Shell up to 20.0 mm in length, broadly elongate-ovate, solid, teleoconch of 4¼-4¾ concavo-convex whorls, protoconch of 3+ smooth, embryonic whorls in specimens examined, first post-embryonic whorl with only fine spirals or an indication of a narrow sutural girdle; sculptured with slender, angulate and sometimes arcuate axial ribs which are usually stronger in the convex part of spire whorls and subangulate on presutural ramp of body whorl, last 8-10 ribs on back of outer lip becoming thin and crowded; ribs number from 13-22 on the penultimate and up to 25 on the body whorl; spiral sculpture consists of overriding spiral threads which number from 4-8 on the penultimate and from 3-6 anterior to the body whorl, central area usually moderately smooth, base of body whorl with 4-11 cords, siphonal fasciole with a prominent, oblique cord. Aperture moderately narrow, outer lip thick but not variced, interior with 13-16 lirae which extend for a short distance into aperture, lower half of columella broadly calloused and with 4-9 weak to obsolete, oblique plicae, siphonal notch deep, anal canal shallow, parietal denticle absent. White in colour, variously spotted with brown and nebulously marked with snow-white, presutural ramp of body whorl sometimes with purple-brown

blotches between ribs, some individuals white, with two broad orange bands on body whorl, aperture white. Operculum amber in colour, elongate and pointed, simple at margins.

TYPE LOCALITY. Seas of Senegal, West Africa.

DISTRIBUTION. From Mauritania to Zaire, West Africa. In moderately shallow water, from 4-25 m.

Type specimens. The type-specimens of *C.desnoyersi lamarcki* Cernohorsky (which are also the types of *Buccinum lyratum* Lamarck), are probably in the general collection of the Museum d'Histoire Naturelle, Geneva. The type has been well illustrated by Kiener (1834-41).

Material examined. WEST AFRICA: Dakar and Gore, Senegal; Sierra Leone (all BMNH).

Literature records. WEST AFRICA: Bel Air Beach, Baié de Hann; Tamara wharf; Cotonou, 25 m; Banana, Congo estuary (Dautzenberg 1912); off Monrovia, Liberia, 10 m; Joal, Senegal (Knudsen 1956).

The substitute name *lamarcki* Cernohorsky, has been proposed in a subspecific sense for *Buccinum lyratum* Lamarck, 1822, which was found to be a primary homonym of *B.lyratum* Gmelin, 1791, a species in the Turridae.

The nominate subspecies *C.desnoyersi desnoyersi* (Basterot, 1825), from the Aquitanian to the Burdigalian, Lower Miocene of Europe, has a larger, more ponderous shell, the spire is more elongate, the depression at the suture of the body whorl deeper, the axial ribs are larger, fewer and wider spaced, and the spiral striae cover the whole surface of the shell. The subspecies *C.desnoyersi turonica* Peyrot, 1903, from the Tortonian, Upper Miocene of Europe, resembles the living West African *lamarcki* more closely. The spire has become more depressed, spiral striae are less prominent and the stromboid notch on the outer lip has weakened.

Cyllene owenii Gray in Griffith and Pidgeon, 1834
(Plate 47, figs.4-6)

1834. *Cyllene owenii* Gray in Griffith & Pidgeon, Anim.Kingd.Cuvier, Moll. & Rad. 12:597, pl.41,fig.2; 1851 A.Adams, Proc.Zool.Soc.Lond. Pt.18:205; 1853 Petit de la Saussaye, J.Conchyl. 4:146; 1872 E.A.Smith, Proc.Zool.Soc.Lond. p.732; 1975 Cernohorsky, Rec.Auckland Inst.Mus. 12:166, figs.90,91.

1853. *Cyllene senegalensis* Petit de la Saussaye, J.Conchyl.4:145, pl.5, fig.5; 1875 P.Fischer, J.Conchyl.23:278; 1912 Dautzenberg, Ann.L'Inst. Ocean. Monaco 5:29; 1927 Dautzenberg, Faune Colon. Franc.1:489; 1947 Nickles, Inst.Franc.d'Afric.Noire 1:11; 1956 Knudsen,Atlantide Rept.No.4:59,pl.3,fig.8.

1859. *Cyllene oweni* Gray, Sowerby, Thes.Conchyl. 3:78, pl.217,figs.19,20; 1875 P.Fischer, J.Conchyl. 23:278; 1877 Kobelt, Jahrb.deut.Malak.Gesell. 4:298; 1881 Tryon, Man.Conch. 3:224, pl.84,figs.564,566.

Shell up to 17.0 mm in length, elongate-ovate, solid, teleoconch of 4¼-4¾ concavo-convex whorls, protoconch of 3+ glassy, smooth, conical embryonic whorls, sutures narrowly canaliculate; second post-embryonic whorl angulate on presutural ramp; sculptured with thin axial ribs which number from 15-19 on the penultimate ramp; sculptured with thin axial ribs which number from 15-19 on the penultimate and from 20-30 on the body whorl, ribs numerous and crowded on the back of outer lip and obsolete on lower two-thirds of body whorl; spiral sculpture consists of crisp, overriding spiral threads which number from 4-7 on the penultimate and from 20-24 on the body whorl, threads producing small nodules at point of intersection with axial ribs, and becoming smoother and flatter on lower two-thirds of body whorl, interspaces with numerous, macroscopic longitudinal striae, sutures with an impressed girdle, siphonal fasciole with an oblique, keeled cord. Aperture narrow, outer lip thick and bluntly variced, anterior edge with a broad, shallow notch which is more prominent in some specimens than in others, interior of aperture with 16-23 short lirae, columella with a glazed callus, anterior half of callus thicker and with 8-14 plicae, siphonal notch deep, anal canal shallow. Usually white in colour, ornamented with 2 broad, purplish-brown bands on body whorl, some brown axial streaks and 3 spiral rows of wide-spaced brown spots, aperture and anterior half of callus white or brown, some individuals uniformly brown in colour. Operculum slender elongate, pointed, simple at margins and with a basal nucleus.

TYPE LOCALITY. None *(owenii)*; West coast of Africa *(senegalensis)*. Senegal, West Africa, is here designated as the type locality.

DISTRIBUTION. Senegal to Cameroons, West Africa. Subtidal, 8-32 m.

Type specimens. Sixteen specimens of *C.owenii* Gray in Griffith & Pidgeon, are in the British Museum (N.H.), London, (no number), dimensions of probable syntype, which is here illustrated, length 15.2 mm, width 8.5 mm (pl.47, fig.4). On the label accompanying these specimens is written "Capt. E. Owen R.N.", and this may be the same lot on which the description of *C.owenii* was based. The holotype of *C.senegalensis* Petit de la Saussaye, is in the "Journal de Conchyliologie" collection, Museum National d'Histoire Naturelle, Paris, length 12.0 mm, width 9.0 mm.

Material examined. WEST AFRICA: (BMNH); Joal, Senegal (BMNH).

Literature records. WEST AFRICA: Ouidah, Dahomey (E.A.Smith 1872); Anse de Boulbine; Ile Roume and Crawford Bank, Los Archipelago; Grand Bassam; Cotonou, 25 m; Congo estuary near Banana; Padrone Pt., and Shart Pt., Congo estuary, 25 m (Dautzenberg 1912); Achorage, Port Bouet, Ivory coast, 16 m; off the Guinea coast, 9°20'N & 14°15'W, 32 m; Bota, Victoria, Cameroon, 8-9 m (Knudsen 1956).

The taxonomy of *C.owenii* Gray in Griffith & Pidgeon, has been discussed in detail by Cernohorsky (1975a). It has been concluded that on the basis of the type figure of *C.owenii*, in conjunction with original material collected by Capt. Owen, and subsequent localisation by E.A.Smith (1872), the taxon *C.owenii* has chronological priority over *C.senegalensis* Petit de la Saussaye.

Cyllene grayi Reeve, 1846
(Plate 47, figs.7-9)

1846. *Cyllene grayi* Reeve, Elements of Conch. 1(5):65, pl.3,fig.12; 1859 Sowerby, Thes.Conchyl. 3:79, pl.217,figs.5,6; 1901 Melvill & Standen, Proc.Zool.Soc.Lond. 2:415.
1850. *Buccinum guillaini* Petit de la Saussaye, J.Conchyl. 1:170, pl.7,fig.4.

Shell up to 25.0 mm in length, roundly elongate-ovate, solid, teleoconch of *c.*4½ concavo-convex whorls, last whorl prominently rounded, protoconch of 3+ glassy, smooth embryonic whorls, sutures adpressed; post-embryonic whorls with fine axial ribs and overriding spiral threads, ribs occasionally thicker posterior to sutures but becoming obsolete on body whorl; sculptured with 4-6 spiral threads in the concave area anterior to sutures on the penultimate whorl, body whorl with 3-4 spiral threads anterior to suture, remaining surface smooth, base with 3-4 spirals and 1 thicker cord. Aperture narrow, outer lip thickened, interior with 16-18 lirae, suture with a narrow channel above outer lip, anterior edge of outer lip with a stromboid notch, columella not calloused but glazed anteriorly and with 7-9 oblique plicae, siphonal notch prominent. White to cream in colour, ornamented with nebulous orange zones, 3 spiral rows of dark brown, wide-spaced spots, anterior part of columella, fasciole and siphonal canal stained with dark brown.

TYPE LOCALITY. None *(grayi)*; Abd-el-Goury I, Red Sea entrance *(guillaini)*. Aden, is here designated as the type locality.

DISTRIBUTION. The Gulf of Aden and tentatively the Gulf of Oman. Habitat unknown.

Type specimens. The probable holotype of *C.grayi* Reeve, is in the British Museum (N.H.), London, No.1966464, length 17.4 mm, width 9.8 mm. The location of the immature holotype of *Buccinum guillaini* Petit de la Saussaye, length 24.0 mm, width 12.0 mm, is unknown, but a paratype of the species, length 21.0 mm, width 12.0 mm, is in the "Journal de Conchyliologie" collection, Museum National d'Histoire Naturelle, Paris.

Material examined. GULF OF ADEN: Aden (AMS; BMNH; USNM); Bay W. of Ras Mujallab, Aden (BMNH).

Cyllene fuscata A.Adams, 1851
(Plate 47,fig.10; Plate 48,figs.1-5; Fig.169)

1851. *Cyllene fuscata* A.Adams, Proc.Zool.Soc.Lond. Pt.18:205; 1859 Sowerby,Thes.Conchyl. 3:77, pl.217,figs.16-18; 1898 Melvill & Standen, J.Conch. 9(2):40.
1851. *Cyllene pallida* A.Adams, Proc.Zool.Soc.Lond. Pt.18:205.
1859. *Cyllene plumbea* Sowerby, Thes.Conchyl. 3:78, pl.217,figs.23,27,28.
1901. *Cyllene fuscata* "H.Adams" (sic), Melvill & Standen, Proc.Zool.Soc.Lond. 2:414.
1903. *Cyllene varians* Cossmann, J.Conchyl. 51:134, pl.6,figs.18-20; 1950 Eames, Geol.Mag. 87(4):245.
1939. *Cyllene (Cyllene) varians* Cossmann, Oostingh, Ing.Ned.Indie Mijnb.Geol. 6(12):186, pl.16,fig.292; 1945 Altena & Beets, Verh.Geol.Mijnb.Genoot.Nederl.Kolon.,Geol., 14:43, figs.23,24.

Shell up to 18.0 mm in length, solid, elongate-ovate, spire short, teleoconch of 4½-5¼ concavo-convex whorls, protoconch of 3½-3¾ conical, glassy, smooth embryonic whorls, initial nucleus very small; sculptured with few or numerous axial ribs which either continue to the back of the outer lip where they become thin and crowded, or become weak and obsolete on the body whorl; ribs number from 20-38 on the penultimate and from 0-31 on the body whorl; spiral sculpture consists of overriding spiral threads which are confined to the anterior sutural area of the body whorl, and also become obsolete at times; spiral threads number from 3-4 on the penultimate and from 0-5 threads anterior to body whorl suture, central part of body whorl usually smooth, base with 4-10 threads and a sharp keel on siphonal fasciole, sutures adpressed and nodulose. Aperture narrow, outer lip thick but not prominently variced, anteriorly with a shallow stromboid notch, interior of aperture with 11-15 lirae, columella calloused, callus thinning above parietal wall, anterior with 6-11 oblique plicae, siphonal notch deep, sutural groove above anal canal distinct. Variable in colour, brown, ornamented with 2-3 spiral rows of small darker brown spots and small white spots distributed at random on body whorl, other individuals white to cream, ornamented with 3 spiral rows of orange-brown spots on

body whorl and a nebulous wavy pattern of orange-brown, spire whorls streaked or blotched with brown, columellar callus white, aperture white or brown. Operculum light amber in colour, elongate, simple at margins.

TYPE LOCALITY. West Africa = error! *(fuscata* and *pallida)*; none *(plumbea)*; Karikal, Pliocene of India *(varians)*. Bombay, India, is here designated as the type locality (specimens in AMS; BMNH; USNM).

DISTRIBUTION. From the Gulf of Oman to East Africa and Indo-Malaysia. Habitat unknown.

Type specimens. A specimen of *C.fuscata* A.Adams, from the Cuming collection, which fully conforms to the original diagnosis, is in the British Museum (N.H.), London, (no number), length 17.0 mm, width 9.8 mm, and this is the questionable holotype (pl.47, fig.10). Three probable syntypes of *C.pallida* A.Adams, are in the same Institution, (no number), dimensions of illustrated syntype length 12.2 mm, width 7.0 mm (pl.48, fig.1). Two syntypes of *C.plumbea* Sowerby, are also in the British Museum (N.H.), (no number), and the syntype measuring length 12.8 mm, width 7.0 mm, is here selected as the lectotype (pl.48, fig.2). The location of *C.varians* Cossmann, is not known to me.

Material examined. EAST AFRICA: Zanzibar (AMS); PAKISTAN: Karachi (BMNH); INDIA: Madras (BMNH); Bombay (AMS; BMNH; USNM); Bandra, Nth. of Bombay (BMNH; USNM); Goa; Back Bay, Bombay (both USNM); SRI LANKA: (BMNH; USNM); MALAYSIA: Malacca (BMNH).

Fossil record. PLIOCENE: Karikal, India (Cossmann 1903 – as *C.varians)*; Tjikarakal, Tjikeusik, Sth. Bantam, Java; Bintoehan, Benkoelen, Sumatra (Oostingh 1939); Tji Gugur, Priangan, W. Java (Altena & Beets 1945).

The species is variable in sculpture and occurs in smooth and axially ribbed forms. Cossmann (1903) illustrates both the smooth and ribbed forms in his Pliocene *C.varians*. The smooth form of *C.fuscata* is similar to *C.grayi* Reeve, but the latter species has 3 spiral rows of dark brown spots and a dark brown smudge over the columellar callus, features lacking in *C.fuscata*.

Cyllene unimaculata A.Adams, 1855
(Plate 48, figs.6,7)

1855. *Cyllene unimaculata* A.Adams, Proc.Zool.Soc.Lond. p.123.

Shell similar in sculpture to *C.fuscata* A.Adams, but slightly smaller and more squat, with only the first 2½ post-embryonic whorls concavo-convex, penultimate whorl weakly convex, protoconch of 3+ glassy, embryonic whorls. It differs further from *C.fuscata* in features of more numerous spiral threads which are crisp and overriding and number between 24-30 on the body whorl, threads becoming granulose anterior to body whorl suture but later flatten out; under magnification, a fine pattern of numerous, macroscopically beaded longitudinal striae cover the body whorl. White in colour, spire whorls with orange-brown streaks, body whorl usually with 2 broad, orange-brown to darker brown, ill-defined spiral bands, one being the sutural band which is frequently only partly visible on the dorsal side of the body whorl, and a very faint basal band which at times may spill over into the siphonal canal, columellar callus and edge of aperture white, deep interior brown.

TYPE LOCALITY. China Seas.

DISTRIBUTION. From China to Northern Australia. Habitat unknown.

Type specimens. Two syntypes of *C.unimaculata* A.adams, are in the British Museum (N.H.), London, No.1961136, and the specimen measuring length 11.7 mm, width 6.8 mm, is here selected as the lectotype (pl.48, fig.6).

Material examined. AUSTRALIA: Broome, Western Australia (coll.Marrow); Hagerstone, Queensland (AMS).

Cyllene lugubris Adams and Reeve, 1850
(Plate 48, fig.8)

1850. *Cyllene lugubris* Adams & Reeve, Zool.Voy.H.M.S."Samarang" Pt.2:33, pl.10, fig.10; 1859 Chenu, Man.Conchyl. 1:161, fig.759.

"Shell ovate, solid, spire pointed, whorls with crowded striae all over, upper ones swollen, and finely nodulosely plicate; chestnut-brown in colour, lip white, upper margins of whorls variegated with white". (Free translation).

"A fine stout species of this characteristic, but little known genus, in which the whorls are finely nodulosely plicate round the upper part".

TYPE LOCALITY. Sooloo Is [= Sulu Is, Philippines].

DISTRIBUTION. Unknown.

Type specimens. Three probable syntypes of *C.lugubris* Adams & Reeve, from Sulu I, are in the British Museum (N.H.), London, (no number), and the specimen measuring length 16.0 mm, width 8.3 mm, which appears to be the specimen illustrated by Adams & Reeve (1848-50), and agrees with the appended measurement scale, is here illustrated (pl.48, fig.8).

I have only seen the type-specimens of this species. It is closely similar to *C.unimaculata* A.Adams, and is only slightly more slender, and the axial ribs on the body whorl descend from the suture to the periphery and become obsolete on the lower half of the body whorl as in the paralectotype of *C.unimaculata*. The shells of *C.lugubris* are dark brown, and the anterior columellar callus, edge of outer lip and some sutures and axial ribs are white. Further research into the relationship between *C.fuscata* and *C.unimaculata* are indicated.

Cyllene pulchella Adams and Reeve, 1850
(Plate 49, figs.1-8)

1850. *Cyllene pulchella* Adams & Reeve, Zool.Voy.H.M.S."Samarang" Pt.2:33, pl.10, fig.11; 1903 Sturany, Denk.k.Akad.Wiss.math.-nat.Wien 74:242; 1907 Hedley, Proc.Linn.Soc.N.S.W. 32:485; 1937 Nomura, Jap.J.Geol. Geog. 14:75; 1961 Habe, Col.Illust shells japan 2:65, pl.32,fig.29; 1978 Cernohorsky, Trop.Pacific mar.shells p.91, pl.28,fig.9.
1851. *Cyllene striata* A.Adams, Proc.Zool.Soc.Lond. Pt.18:205; 1916 Hedley, J.Roy.Soc.W.Australia 1:60.
1851. *Cyllene glabrata* A.Adams, Proc.Zool.Soc.Lond. Pt.18:206; 1859 Sowerby, Thes.Conchyl. 3:79, pl.217, figs.14,15; 1895 Pilsbry, Cat.mar.Moll.Japan p.32.
1911. *Cyllene oblonga* Schepman, Siboga-Exped. 49d:301, pl.22, fig.10.
1939. *Cyllene (Cyllene bantamensis* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12):186, pl.16,figs.293-296.

Shell up to 17.0 mm in length, elongate-ovate, solid, teleoconch of 4¾-5½ flat-sided to weakly concavo-convex whorls, protoconch of 3-3½ glassy, smooth, golden brown-banded embryonic whorls; axial sculpture variable, consisting of thin axial riblets which number from 15-25 on the penultimate whorl, axials irregular, sometimes only present on the weakly shouldered presutural ramp or absent altogether on body whorl; spiral sculpture consists of crisp, overriding spiral threads which form minute nodules at point of intersection, spirals usually more prominent anterior to suture and at base of body whorl, centre of whorl with fine spiral grooves or smooth; spirals number from 5-8 on the penultimate and from 9-28 on body whorl, basal 5-6 cords strong. Aperture longer than the spire, elongate, outer lip thickened, interior with 14-19 lirae which partly extend into aperture, columella thinly calloused, anterior part of callus thicker and with 6-9 oblique plicae, parietal area only glazed, siphonal notch deep, anal canal weak, parietal fold absent, stromboid notch on anterior edge of outer lip distinct or shallow. Variable in colour, white to grey or light brown, ornamented with brown blotches, spots and axial streaks, some individuals uniformly creamy-white or dark brown, anterior columellar callus and edge of aperture white, deep interior brown. Operculum brown in colour, elongate-ovate, pointed at ends and simple at margins.

TYPE LOCALITY. Borneo, Indonesia, on shore *(pulchella)*; Albrokkas Is [= Albrolhos Is, West Australia] *(striata)*; Pasiaco, Philippines, 16 m *(glabrata)*; Bougainville Strait, Indonesia, 0°3.8'N & 130°24.3'E, 141 m *(oblonga)*; Tjibitjak, Sth. Bantam, Pliocene of Java, Indonesia *(bantamensis)*.

DISTRIBUTION. From the Red Sea to India, Japan and the New Hebrides. In black, grey or muddy sand, from the intertidal zone to a depth of 141 m.

Type specimens. The following type-specimens are in the British Museum (N.H.), London: the faded, probable holotype of *C.pulchella* Adams & Reeve (no number), length 14.8 mm, width 7.7 mm; three syntypes of *C.striata* A.Adams, (no number), and the specimen measuring length 12.2 mm, width 6.0 mm, is here designated as the lectotype (pl.49, fig.2); and three syntypes of *C.glabrata* A.Adams, (no number), and the specimen measuring length 12.5 mm, width 6.3 mm, is here designated as the lectotype (pl.49, figs.3,4). The syntype of *C.oblonga* Schepman from Bougainville Strait, ZMA, length 13.4 mm, width 6.8 mm, is here selected as the lectotype (pl.49, fig.5). The type of *C.bantamensis* Oostingh, is presumably in the Museum of Bandoeng, Indonesia.

Material examined. REUNION I: Cap la Houssaye, 25 m (coll.Martin) [tentative record only]; SRI LANKA: (AMS); INDONESIA: Kuta Beach, Bali (coll.McCausland); PHILIPPINES: Pasiaco, 16 m (BMNH); PAPUA NEW GUINEA: Rabaul, New Britain (coll.Prior); AUSTRALIA: Western Australia: Ningaloo, Sth. of Northwest Cape (AMS); Roebuck Bay (NMV); Northern Territory: 36 km off Point Charles, Darwin (AMS); Queensland: Dingo Beach, Cape Gloucester; off North reef, 23°08'S & 152°12'E, 115 m; Bowen; Middleton reef, 29°28'S & 159°06'E; Masthead I, Capricorn group (all AMS); SOLOMON IS: Gihili, Bougainville (AMS); NEW HEBRIDES: Black sands, Efate I (coll.Marrow); Mele Beach, Efate I (coll.Cole); Mele Bay near Mele I, Efate I (coll.McCausland); NEW CALEDONIA: Poindimie; Isle of Pines (both AMS).

C.pulchella is the most widely distributed and also the most variable of all *Cyllene* species. Some individuals are brightly coloured while others are almost uniformly creamy-white.

The Reunion I record of *C.pulchella* is only tentative. All 29 specimens examined from this locality had a protoconch of only 1¾-2 bulbous embryonic whorls, whereas specimens from other areas examined had from 3-3½ embryonic whorls. In all other features the Reunion specimens cannot be separated from *C.pulchella*. Since a similar problem of differences in development in lookalike species has been encountered in some other species of Buccinacea, it was thought advisable not to give taxonomic recognition to the Reunion population until the protoconchs of all other similar species of *Cyllene* are known and more material is available for study.

Cyllene rubrolineata Sowerby, 1870
(Plate 49, figs.9-11)

1870. *Cyllene rubrolineata* Sowerby, Proc.Zool.Soc.Lond. p.251.

Closely similar in size, form and sculpture to *C.pulchella* Adams & Reeve, differing only in following particulars: shell cream to pale bluish-white in colour and ornamented with very faint orange flames and 3 broad bands on body whorl; the most prominent feature is the reddish-brown or orange-brown edging on the sutural groove, edge of columellar callus, siphonal canal and edge of outer lip; the raised keel on the siphonal fasciole similarly coloured, and the coloured keel even visible under the columellar callus entering the aperture.

TYPE LOCALITY. None.

DISTRIBUTION. Unknown. Known at present only from Taiwan.

Type specimens. The holotype of *C.rubrolineata* Sowerby, is in the British Museum (N.H.), London, No.1874.12.11.198, length 10.0 mm, width 5.3 mm.

Material examined. TAIWAN: (coll.Allo).

Apart from the holotype, a single specimen from Taiwan has been seen, and this specimen corresponds with the holotype in most features. It is impossible to decide on the basis of 2 specimens if *C.rubrolineata* is a valid species or only a colour form of *C.pulchella* Adams & Reeve.

Cyllene orientalis A.Adams, 1851
(Plate 49, fig.12)

1851. *Cyllene orientalis* A.Adams, Proc.Zool.Soc.Lond. Pt.18:205.

Closely similar in size, form and sculpture to *C.pulchella* Adams & Reeve, differing only in having more numerous, thinner axial riblets and bisecting thin spiral threads which form minute nodules at the point of intersection. Creamy-white, ornamented with faint orange flames.

TYPE LOCALITY. Singapore, 11 m and Malacca, 11 m, Malaysia.

DISTRIBUTION. Indo-Malaysia. Subtidal, from 11-40 m.

Type specimens. Three syntypes of *C.orientalis* A.Adams, are in the British Museum (N.H.), London, (no number), and the specimen measuring length 13.8 mm, width 6.7 mm, is here designated as the lectotype (pl.49, fig.12).

Material examined. INDONESIA: Sunda Strait, 6°10'S & 105°44'E, 40 m (ZMC).

This species is only tentatively accepted as valid. Some individuals of *C.pulchella* also have a similar sculpture of thin riblets and bisecting spirals, and some individuals closely approach *C.orientalis*.

Cyllene pretiosa Vredenburg, 1924
(Plate 50, fig.1)

1924. *Cyllene pretiosa* Vredenburg, Rec.Geol.Surv.India 55:69,pl.2, figs.2a-c.

Similar to *C.orientalis* A.Adams, but sculpture coarser and more granulose, consisting of bisecting axials and spirals of about equal strength forming nodules upon summits; spiral cords close-set, siphonal fasciole with a keeled cord, aperture lirate, columella calloused, spire whorls almost flat-sided, spire described as bulbous in original description.

TYPE LOCALITY. Dalabe; Thanga; Tittabwe, Miocene of Burma.

DISTRIBUTION. Miocene of Burma.

Type specimens. The holotype of *C.pretiosa* Vredenburg, length *c.* 13.6 mm, width 7.4 mm, is presumably in the Geological Survey of India.

Cyllene smithi K.Martin, 1884
(Plate 50, fig.2)

1884. *Cyllene smithi* K.Martin, Samml.geol.Reichs-Mus.Leiden, (1), 3:125, pl.7,fig.139.

"Shell ovate, moderately high and pointed, protoconch of 3 smooth embryonic whorls, teleoconch of 3 whorls. Mature whorls canaliculate at sutures, whorls axially ribbed, ribs strengthening anteriorly; ribs are bisected by close-set spiral threads, one row forming sutural nodules, ribs nodulose at point of intersection with spirals. Body whorl similarly sculptured as spire whorls. Aperture elongate-ovate, siphonal canal distinct, columella thin, calloused, prominently plicate, outer lip narrowly variced, interior lirate." (Abridged translation).

TYPE LOCALITY. Bore hole III, Batavia, Java, depth 117 m, Upper Miocene of Indonesia.

DISTRIBUTION. Miocene of Indonesia.

Type specimens. Syntypes of *C.smithi* K.Martin, are in the Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9179, and the specimen illustrated by Martin (1883-87), and which is holed on the dorsal side of the body whorl, length 8.7 mm, width 5.9 mm, is here selected as the lectotype (pl.50, fig.2).

Cyllene angsanana K.Martin, 1921
(Plate 50, fig.3)

1921. *Cyllene angsanana* K.Martin, Samml.geol.Reichs-Mus.Leiden, N.S., 1:459, pl.59,figs.37,37a; 1931 van der Vlerk, Leidsche geol.Meded. 5:231.

"Pointedly-ovate with a conical form, anteriorly hardly constricted. From the pointed protoconch only 2 smooth whorls remain; and presumably 3 were originally present as in *C.smithi* Martin. Remaining whorls are flat, separated by narrow channeled sutures which carry a girdle and an adjacent groove; sutural girdle with a row of sharp nodules which are connected to slightly oblique and granulose ribs; spiral cords with finer, intermediate spiral threads. Aperture ovate, posteriorly narrowly channeled, siphonal canal short, deep, with a calloused fasciole and a keel which produces a weak fold on anterior of columella; additional similar plicae are present which are distributed from the fasciolar cord to the start of the siphonal canal, remainder of columella smooth; outer lip thickened but without a varix, interior with slender lirae.

The fossil is similar to *C.smithi*, but in the latter species the whorls are not flat, and the third post-embryonic whorl has more numerous close-set spirals. The varix on the outer lip is also distinctly bordered; the lirae inside the aperture are short, and finally the plicae on the columella of *C.smithi* are not as regularly developed." (Abridged translation).

TYPE LOCALITY. Tji Angsana, Njalindung beds, Java, Lower Miocene of Indonesia.

DISTRIBUTION. Miocene of Indonesia.

Type specimens. The holotype of *C.angsanana* K.Martin, is in the Rijkmuseum van Geologie en Mineralogie, Leiden, No. RGM-9181, length 17.3 mm, width 10.0 mm.

Cyllene vredenburgi Gupta, 1930
(Plate 50, fig.4)

1930. *Cyllene vredenburgi* Gupta, Rec.Geol.Surv.India 63:208, pl.5,figs.1,1a,1b.

"Test small, elongate-oval; whorls ornamented with axial ribs. Body whorl large. The axial ribs in the body whorl crossed by faint radial furrows, producing a somewhat cancellated appearance. The posterior portion of the body whorl is gradually sloping towards the suture. There are three spiral furrows in the slope, cutting the axial ribs, which are slightly wavy. Aperture oval. Outer lip oblique, with plications. Inner lip callous. Anterior columellar margin with six plications, placed almost at equal distances from one another. The distance between the second and third plications (counting from the posterior side) is slightly greater. The second and third plications are also thickened and slightly bent at their outer extremity." (Original description).

TYPE LOCALITY. Stream 0.8 km above Myaukmigon, Pegu beds, Miocene of Burma.

DISTRIBUTION. Miocene of Burma.

Type specimens. The holotype (an immature specimen) of *C.vredenburgi* Gupta, is presumably in the Geological Survey of India collection. No dimensions were cited by the author, but from measurements of the illustration, the length is *c.* 12.5 mm, width 8.0 mm.

Cyllene gracilenta (Yokoyama, 1928)
(Plate 50, figs.5,6)

1928. *Cassis gracilenta* Yokoyama, Imp.Geol.Surv.Japan Rept. No.101:46, pl.3, fig.4.
1960. *Cyllene gracilenta* (Yokoyama), MacNeil, U.S.Geol.Surv.Prof.Pap. No. 339:82, pl.2,fig.27.

"Shell small, with spire comparatively high. Whorls about six, convex, ornamented with longitudinal folds which in the single specimen we possess number twelve. Body whorl twice as long as spire, transversely grooved. Canal short, but strongly sideward." (Original description).

TYPE LOCALITY. Intoshi, Shinchik, Lower Byoritzu beds, Pliocene of Taiwan.

DISTRIBUTION. Miocene of Ryukyu Is and Pliocene of Taiwan.

Type specimens. The holotype of *C.gracilenta* (Yokoyama), is presumably in the Geological Survey of Japan collection. The original dimensions were length 18.0 mm, width 10.5 mm.

Material examined. MIOCENE: Shimijiri group, Yonabaru clay, Okinawa, Ryukyu Is (USNM).

The type specimen of *C.gracilenta* is not in the best state of preservation. Illustrated is a specimen considered to be *C.gracilenta* from Okinawa, by MacNeil (1960) [Plate 50, fig.6].

Cyllene sulcata Sowerby, 1859
(Plate 50,figs.7,8; Plate 51,figs.1,2; Fig.171)

1854. *Cyllene sulcata* H. & A.Adams, Gen.Rec.Moll. 1:125 (nomen nudum).
1859. *Cyllene sulcata* Sowerby, Thes. Conchyl. 3:77, pl.217,figs.10,11; 1981 Cernohorsky, Rec.Auckland Inst.Mus. 18:186, figs.87-89 (shell), fig.91 (protoconch).

Shell up to 15.0 mm in length, elongate-ovate, some individuals broader than others, dull, teleoconch of 5-5¼ flat-sided to concave whorls, protoconch of 1½-1¾ smooth, orange-brown embryonic whorls, nucleus occasionally milky-white, sutures adpressed, sharp and wavy; sculptured with coarse, wide-spaced axial ribs which number from 8-15 on the penultimate and from 3-11 on body whorl, ribs occasionally subangulate on presutural ramp of body whorl or at times becoming obsolete; spiral sculpture consists of numerous, close-set spiral threads which number from 6-8 on the penultimate and from 25-35 on the body whorl, siphonal fasciole with a keeled cord; under magnification numerous, close-set longitudinal striae are visible. Aperture moderately narrow, outer lip thickened, interior with 14-17 lirae, columella calloused, callus broader and thicker anteriorly and with 8-10 oblique plicae, siphonal notch deep, parietal denticle absent, anal canal channeled into a sutural groove. Dull-white to cream or grey in colour, some individuals lined, spotted or suffused with greenish-brown, summits of sutures with small brown spots or short lines, columellar callus and edge of aperture white, deep interior frequently brown. Operculum brown, elongate-ovate, pointed at ends and simple at margins.

TYPE LOCALITY. None. Broome, Western Australia (designated Cernohorsky 1981a).

DISTRIBUTION. To date known only from Western Australia. Habitat unknown.

Type specimens. The lectotype of *C.sulcata* Sowerby, is in the British Museum (N.H.), London, No.1980106, length 14.5 mm, width 8.1 mm.

Material examined. WESTERN AUSTRALIA: Roeburne; Point Cloates (both AMS); Broome (NMV; coll.Marrow); Swan Pt. (NMV).

Cyllene concinna A.Adams, 1851
(Plate 51, figs.3-5)

1851. *Cyllene concinna* A.Adams, Proc.Zool.Soc.Lond. Pt.18:205; 1859 Sowerby, Thes.Conchyl. 3:79, pl.217,figs.29,30; 1877 Kobelt, Jahrb.deut.Malak.Gesell. 4:297; 1979 Habe, J.Biol.Stud.Nagasaki Pref. No.18:14.
1904. *Cyllene japonica* Pilsbry, Proc.Acad.Nat.Sci.Philadelphia 56:19, pl.4,fig.34; 1961 Habe, Col.illust.shells Japan 2:65, pl.32,fig.28; 1967 Habe & Kosuge, Stand.book Jap.shells col.3:75, pl.29,fig.25.

Shell up to 13.0 mm in length, elongate-ovate, moderately slender for a *Cyllene* species, teleoconch of 4½-5 flat-sided to weakly convex whorls, protoconch of 2 smooth embryonic whorls; sculptured with thin, numerous axial riblets which number from 30-40 on the penultimate and from 30-38 on the body whorl, ribs sometimes obsolete on last 2 whorls or becoming short on body whorl and fading out anteriorly; crisp spiral striae override axial riblets and produce a minutely granulose sculpture on the posterior half of the penultimate whorl and anteriorly to body whorl suture; spirals number from 3-6 on the penultimate and from 5-6 anterior to suture of body whorl, followed by 15-25 spiral grooves which produce flattish cords, siphonal fasciole with a keeled cord. Aperture narrow, elongate, outer lip thickened but not variced, interior with 17-18 lirae, columella calloused, callus thicker anteriorly but thinner above parietal wall, anterior of columella with 4-10 oblique plicae, siphonal notch deep, anal canal constricted into sutural channel. White to flesh in colour, ornamented with a few brown

spots at sutures and body whorl, some individuals densely marbled or banded with tan or brown, columella white, occasionally with a brown stain anteriorly, aperture white.

TYPE LOCALITY. Guinea, West Africa = error! *(concinna)*; Hirado, Hizen, Japan *(japonica)*. Osima, Osumi, Japan, is here designated as the type locality (specimens in USNM).

DISTRIBUTION. From the Ryukyu Is to Japan. Habitat unknown.

Type specimens. Three syntypes of *C.concinna* A.Adams, are in the British Museum (N.H.), London, (no number), and the specimen measuring length 10.8 mm, width 4.8 mm, is here selected as the lectotype (pl.51, fig.3). The holotype of *C.japonica* Pilsbry, is in the Academy of Natural Sciences, Philadelphia, No.82144, length 11.8 mm, width 5.5 mm.

Material examined. JAPAN: Yakusima, Osumi; Osima, Osumi; Kikaigashima (all USNM); Hirado, Hizen (ANSP); Kii Peninsula (coll.Hashimoto).

Habe (1979) appears to be the first author to synonymise *C.japonica* with *C.concinna*. The lectotype, although worn, clearly shows the granulose sculpture confined to the posterior half of the spire whorls and posterior subsutural area of body whorl, which is typical of the species.

Cyllene sibogae Schepham, 1911
(Plate 51, figs.6,7; Fig.170)

1911. *Cyllene sibogae* Schepman, Siboga-Exped. 49d:301, pl.19,fig.7.

Shell up to 18.0 mm in length, elongate-ovate, solid, teleoconch of 5-5½ concavo-convex whorls, protoconch of 3-3¼ glassy, smooth embryonic whorls, sutures prominently adpressed, whorls subangulate on presutural ramp; sculptured with thin axial ribs which number from 13-19 on the penultimate and from 14-17 on body whorl, ribs more irregular towards outer lip and slightly nodose on presutural ramp of body whorl; spiral sculpture consists of crisp, overriding spiral threads which number from 9-14 on the penultimate whorl, concave area anterior to body whorl suture with 9-10 crisp cords, followed by 9-10 spiral grooves and 4-5 cords at the base, siphonal fasciole with a keeled cord. Aperture moderately narrow, outer lip thick, interior with 15-16 lirae, columella calloused and with a prominent glaze above parietal wall, anterior of columella with 9-11 plicae, siphonal notch deep, anal canal constricted into a sutural channel, stromboid notch on anterior edge of outer lip distinct. White to fawn in colour, densely ornamented with brown or greyish-brown, columellar callus and edge of aperture light fawn. Operculum light brown and simple at margins.

TYPE LOCALITY. Sulu Archipelago, Indonesia, 6°09'N & 120°21'E, 350 m.

DISTRIBUTION. From Indonesia to Western Australia. Subtidal, in coral and shell-debris, from 296-350 m.

Type specimens. The holotype of *C.sibogae* Schepman, is in the Zoological Museum, University of Amsterdam, length 17.4 mm, width 9.0 mm.

Material examined. WESTERN AUSTRALIA: North of Port Hedland, 18°10'S & 118°22'E, 296 m (AMS).

Cyllene lactea A.Adams and Angas, 1864
(Plate 51, fig.8)

1864. *Cyllene lactea* A.Adams & Angas, Proc.Zool.Soc.Lond. for 1863:422; 1867 Angas, Proc.Zool.Soc.Lond. p.191; 1901 Hedley, Proc.Linn.Soc.N.S.W. 26(1):19, pl.2,fig.10; 1903 Hedley, Mem.Austral.Mus. 4:375; 1918 Hedley, J.Proc.R.Soc.N.S.W. 51:M87; 1981 Cernohorsky, Rec.Auckland Inst.Mus. 18:183, fig.84.
1962. *Radulphus lacteus* Adams & Angas, Iredale & McMichael, Austral.Mus.Mem.No.11:73.

Shell up to 15.0 mm in length, elongate-ovate, teleoconch of 4¾-5 concavo-convex whorls, protoconch of 2 smooth, glassy embryonic whorls. Sculptured with axial ribs which are subangulate posteriorly to sutures and number from 15-17 on the penultimate whorl but are absent or very weak on body whorl; spiral sculpture consists of spiral striae which number from 4-5 on the penultimate whorl, shoulder of body whorl with 4-6 spiral cords, centre moderately smooth, base of shell with 8-10 spirals, siphonal fasciole with a keeled cord. Aperture moderately narrow, elongate, outer lip thickened, interior finely lirate, columella calloused, callus spreading on lower half of body whorl and with 7-9 oblique plicae anteriorly, siphonal notch prominent, anal canal constricted into a sutural channel. Fawn to light brown in colour, marbled with light brown, sutures occasionally spotted with brown.

TYPE LOCALITY. Port Stephen, New South Wales, Australia. According to Hedley (1901), Brazier identified the types as coming from inner North Head, Sydney Harbour, 8 fathoms (15 m).

DISTRIBUTION. Apparently endemic to New South Wales, Australia. Subtidal, from 7-49 m.

Type specimens. The faded and somewhat worn lectotype of *C.lactea* A.Adams & Angas, is in the

British Museum (N.H.), London, No.1870.10.26.86, length 13.7 mm, width 6.7 mm.

Material examined. AUSTRALIA: New South Wales: Port Jackson (coll.Powell); Six mile Beach, Port Stephens; off Green Pt., Watson's Bay, 7 m; Black Rock, Richmond River; Shelley Beach, Angourie; Woolgoolga; Sydney Harbour; Long reef, Collaroy; Inner North Head, Port Jackson; Newcastle Bight, 44-49 m; Halliday's Pt., Nth. of Forster (all AMS); Simpson's Beach, Port Hacking (coll.Marrow).

Cyllene royana (Iredale, 1924)
(Plate 51, figs.9,10; Fig.172)

1924. *Radulphus royanus* Iredale, Proc.Linn.Soc.N.S.W. 49(3):270, pl.34, fig.8; 1962 Iredale & McMichael, Austral.Mus.Mem. No.11:73; 1962 Gabriel, Mem.Nat.Mus.Victoria No.25:188.
1962. *Radulphus royana* Iredale, Macpherson & Gabriel, Mar.Moll.Victoria Handb. No.2:196.
1981. *Cyllene royana* (Iredale), Cernohorsky, Rec.Auckland Inst.Mus. 18:185, figs.85,86 (shell), fig.90 (protoconch).

The species is closely similar to *C.lactea* A.Adams & Angas, and differs only in the coarser sculpture which is mainly characterised by the presence of 14-15 axial ribs on the body whorl which are more prominently angulate on the presutural ramp. The colouring is also similar with a white and brown marbling pattern and brown spots at sutures.

TYPE LOCALITY. Twofold Bay, New South Wales, Australia, 27-46 m.

DISTRIBUTION. According to available records known only from New South Wales and Victoria, Australia. Subtidal, from 27-50 m.

Type specimens. The holotype of *C.royana* (Iredale), is in the Australia Museum, Sydney, No. C-74642, length 15.1 mm, width 7.5 mm.

Material examined. AUSTRALIA: New South Wales: Middle Harbour, Sydney; Broken Bay; Ocean Beach (all AMS); Twofold Bay, 27-33 m (AMS; NMV); Victoria; off Lakes Entrance, 37 m (NMV; coll.Marrow).

Fossil record. HOLOCENE: Bore at Tomugo, New South Wales, 16-17 m depth (AMS).

The species is rare and the range of variability is unknown. It is possible, however, that *C.royana* is only a sculptural variant of *C.lactea*. *C.royana* is only tentatively accepted as a valid species pending examination of more extensive material.

DUBIOUS SPECIES AND SPECIES EXCLUDED FROM THE CYLLENINAE

Cyllene bellana Harris, 1896

1896. *Cyllene bellana* Harris, Proc.Acad.Nat.Sci.Philadelphia p.479, pl.23, fig.4 (Bell's Landing, Eocene of Alabama, U.S.A.).

This Eocene species only superficially resembles *Cyllene* and lacks the closely plicate columellar callus and sutural grooves at the juncture of the outer lip. The species appears to belong to the family Buccinidae.

Cyllene bicanalifera Petit de la Saussaye, 1853

1832. *Columbella bicanalifera* Sowerby, Proc.Zool.Soc.Lond. Pt.2:113 (Galapagos Is, 18 m).
1853. *Cyllene bicanalifera* Petit de la Saussaye, J.Conchyl. 4:148 (ref. to Sowerby, Thes.Conchyl. 1:pl.39, fig.144).

In his list of known *Cyllene* species, Petit de la Saussaye (1853) included *C.bicanalifera* and cited illustrations in Sowerby (1844) of *Columbella bicanalifera*. The species depicted is *Bifurcium bicanaliferum* (Sowerby, 1832), a species of Columbellidae from the west coast of America.

Cyllene chrysostoma Moerch, 1852

1852. *Cyllene chrysostoma* Moerch, Cat.Conchyl.Yoldi 1:80 (ref. to Lister, pl.968, fig.22b and Sowerby, Man.Conch. fig.425 ?) [Antilles].

The shell illustrated by Lister (1770) on plate 968, fig. 22b, appears to be an immature *Cyllene* species of unknown identity. The original locality indication of "Antilles" is probably erroneous.

Cyllene gibba A.Adams, 1870

1870. *Cyllene gibba* A.Adams, Ann.Mag.Nat.Hist. (4), 5:427 (Kino-O-Sima, Japan).

The species has not been illustrated, the type is lost, and the species remains unidentifiable.

Cyllene incisa Oostingh, 1939

1939. *Cyllene (Cyllene) incisa* Oostingh, Ing.Ned.-Indie Mijnb.Geol. 6(12): 187, pl.17, figs.297, 298 (no such plate and figures) [Tjileuleuj, Tjipatjar deposits, Java, Pliocene of Indonesia].

Although Oostingh (1939) refers to "plate 17, figs.297,298" for an illustration, his work does not contain plate 17 at all, plate 16 being the last published. The dimensions given were length 15.5 mm, width 7.0 mm. The holotype could be in the Museum of Bandoeng, Indonesia.

Radulphus necopinatus Finlay, 1930

1930. *Radulphus necopinatus* Finlay, Trans.Proc.New Zeal.Inst. 61(2):236 (Cape Maria van Diemen, New Zealand).

This is not a *Radulphus* (= *Cyllene*) but it is a species of *Cominella* Gray, family Buccinidae.

PLATE 1

Fig. 1. *Nassarius arcularia arcularia* (Linnaeus). Type-specimen Linnean Society, London; 28.1 mm.

Fig. 2. *N.arcularia arcularia* (Linnaeus). Karoni I, Lau group, Fiji Is; 22.3 mm.

Fig. 3 *N.arcularia arcularia* (Linnaeus). Nicobar Is; 33.0 mm. Specimen with small columellar callus.

Fig. 4. *N.arcularia plicatus* (Roeding). Lectotype figure from Martini & Chemnitz (1773, pl.41, fig.412).

Fig. 5. *N.arcularia plicatus* (Roeding). Holotype of *Nassa sulcifera* A.Adams, BM(NH) No. 1973125; 30.1 mm.

Fig. 6. *N.arcularia plicatus* (Roeding). Dorsal view of type-figure of *Buccinum obvelatum* Deshayes (from Deshayes in Laborde & Linant, 1834, pl.66, fig.5).

Fig. 7. *N.arcularia plicatus* (Roeding). Juvenile holotype of *Nassa crispata* Marrat, Merseyside County Museum, Liverpool; 13.0 mm.

Fig. 8. *N.arcularia plicatus* (Roeding). Reunion I; 25.0 mm.

Fig. 9. *N.arcularia plicatus* (Roeding). Strongly sculptured form *obvelata* Deshayes. Port Sudan, Red Sea; 16.1 mm.

Fig. 10. *N.coronatus* (Bruguière). Muscat, Gulf of Oman; 29.5 mm.

Fig. 11. *N.coronatus* (Bruguière). Onna Pt., Okinawa, Ryukyu Is; 27.8 mm.

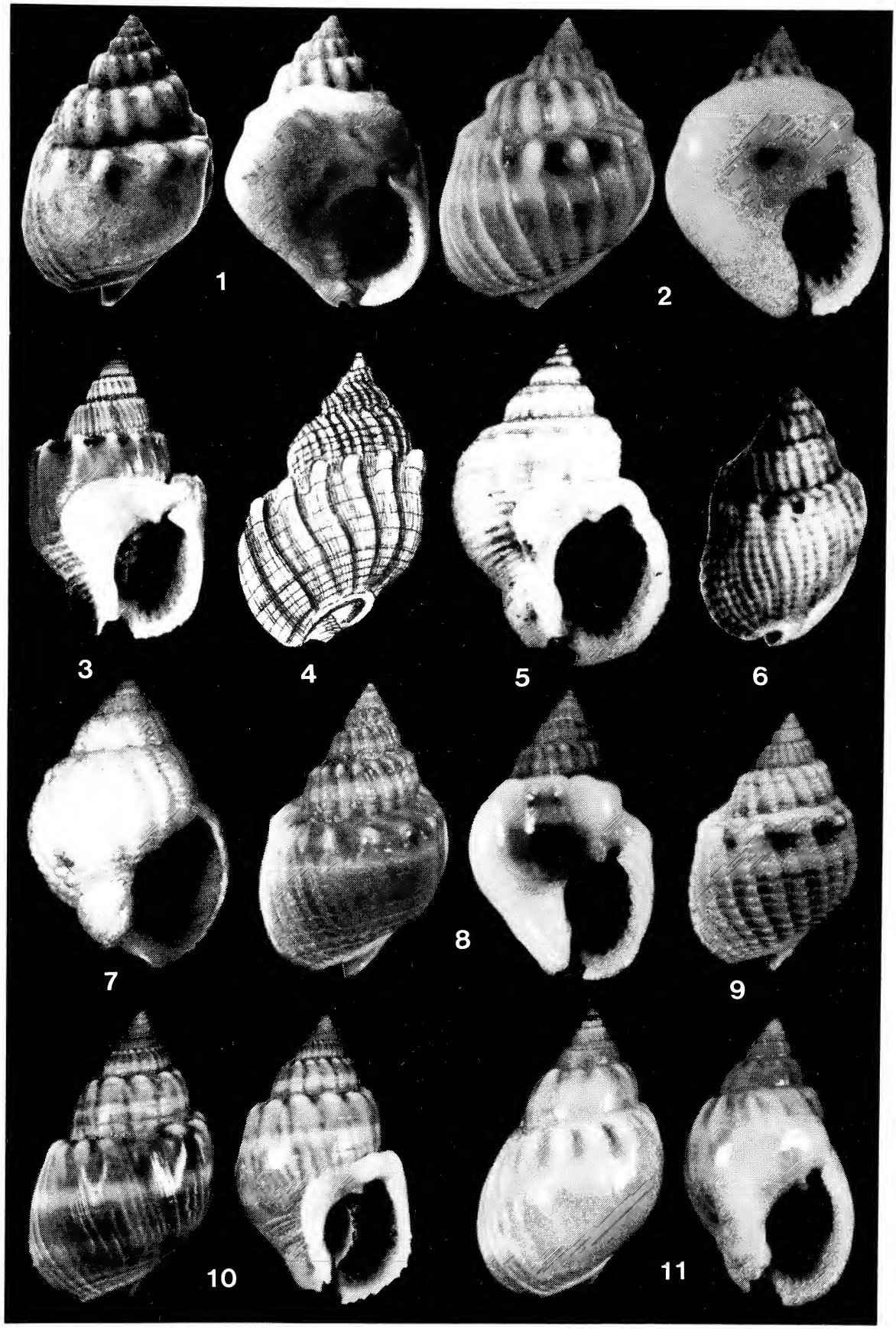

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PLATE 2

Fig. 1. *Nassarius optimus* (Sowerby). Holotype BM(NH) No. 1903.11.5.4.; 25.1 mm.

Fig. 2. *N.optimus* (Sowerby). Labuan, Sabah, Indonesia; 19.5 mm.

Fig. 3. *N. (Alectrion) papillosus* (Linnaeus). Probable holotype Linnean Society, London; 46.4 mm.

Fig. 4. *N. (A.) papillosus* (Linnaeus). Electric Beach, Oahu, Hawaiian Is; 37.6 mm.

Fig. 5. *N. (A.) glans glans* (Linnaeus). Holotype Linnean Society, London; 43.1 mm.

Fig. 6. *N. (A.) glans glans* (Linnaeus). Ogea I, Lau group, Fiji Is; 23.2 mm. Ribbed form.

Fig. 7. *N. (A.) glans glans* (Linnaeus). Mackay, Queensland, Australia; 39.4 mm. Smooth form.

Fig. 8. *N. (A.) glans fenwicki* Kilburn. Holotype Natal Museum, No. 8952 (T-1638); 22.3 mm.

Figs.9,10. *N. (A.) psila* (Watson). Holotype BM(NH) No.1887.2.9.636.; 19.0 mm.

Fig. 11. *N. (A.) hirtus* (Kiener). Dorsal view of type-figure (from Kiener, 1834-41, pl.19, fig.72).

Fig. 12. *N. (A.) hirtus* (Kiener). Syntype of *Nassa seminodosa* A.Adams, BM(NH) No. 1973134; 33.5 mm.

Fig. 13. *N. (A.) hirtus* (Kiener). Electric Beach, Oahu, Hawaiian Is; 26.8 mm.

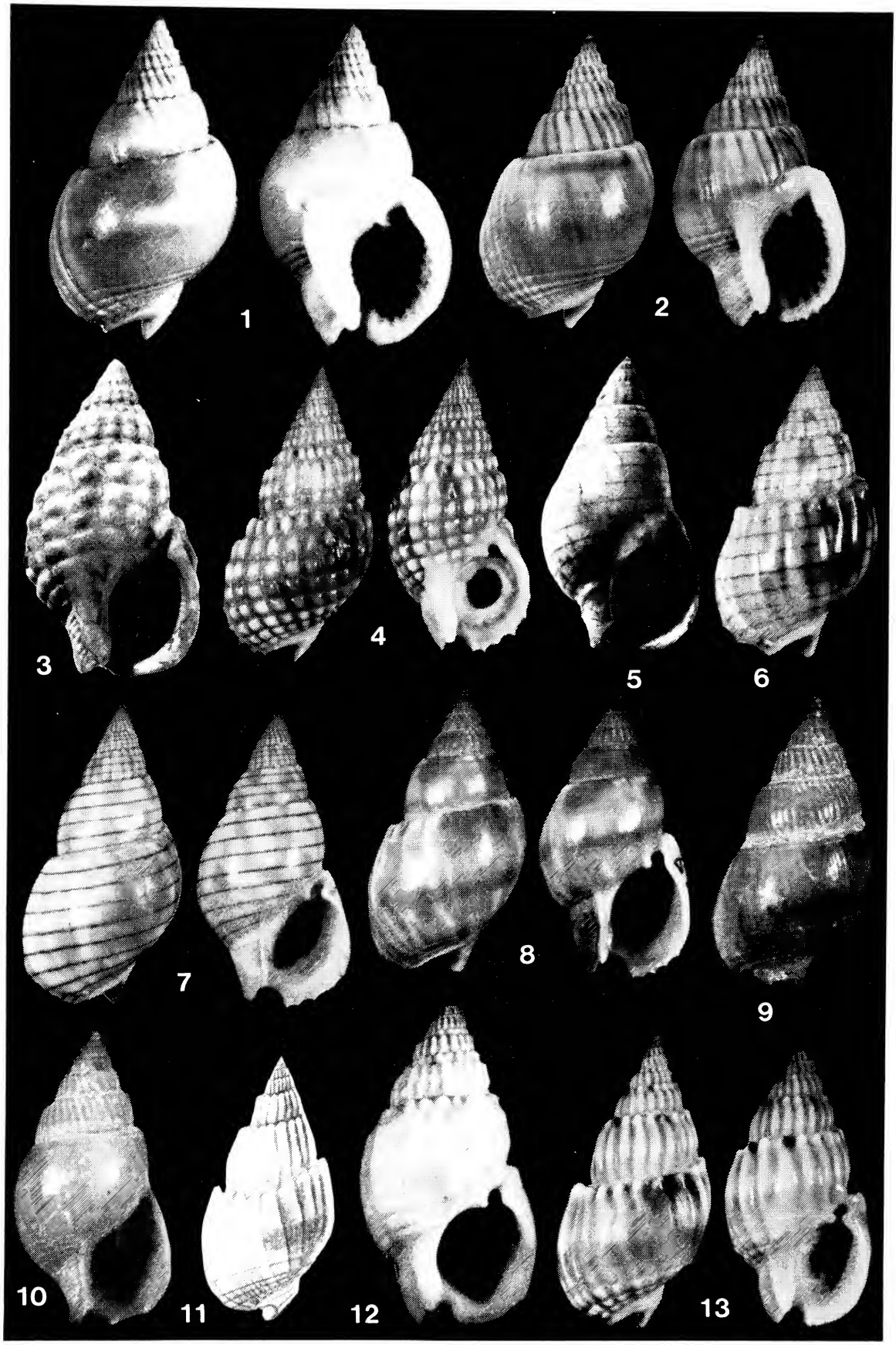
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PLATE 3

Fig. 1. *Nassarius (Plicarcularia) pullus* (Linnaeus). Probable holotype Linnean Society, London; 22.0 mm.

Fig. 2. *N. (P.) pullus* (Linnaeus). Lectotype of *Nassa dorsuosa* A.Adams, BM(NH) No. 197335; 15.5 mm.

Fig. 3. *N. (P.) pullus* (Linnaeus). Illustrated lectotype of *Buccinum thersites* Bruguière (from Martini & Chemnitz, 1773, pl.41, fig.413).

Fig. 4. *N. (P.) pullus* (Linnaeus). Type-figure of *Nassa gracilis* Pease (from Pease, 1868, pl.23, fig.4).

Fig. 5. *N. (P.) pullus* (Linnaeus). Holotype of *irus* v.Martens, ZMHU; 17.3 mm.

Fig. 6. *N. (P.) pullus* (Linnaeus). Specimen of the form *irus* v.Martens. Mauritius; 17.1 mm.

Fig. 7. *N. (P.) pullus* (Linnaeus). Type-figure of *Nassa sondeiana* K.Martin (from K.Martin, 1895, pl.18, fig.257).

Fig. 8. *N. (P.) pullus* (Linnaeus). Holotype of *acypha* v.Martens, ZMHU; 17.0 mm.

Fig. 9. *N. (P.) pullus* (Linnaeus). Labuan, Sabah, Borneo; 20.3 mm.

Figs.10,11. *N. (P.) leptospirus* (A.Adams). Lectotype BM(NH) No. 197347; 16.7 m.

Fig. 12. *N. (P.) leptospirus* (A.Adams). Cliff I, Palawan group, Philippines; 10.9 and 11.8 mm respectively.

Fig. 13. *N. (P.) bellulus* (A.Adams). Lectotype BM(NH) No. 197316; 10.0 mm.

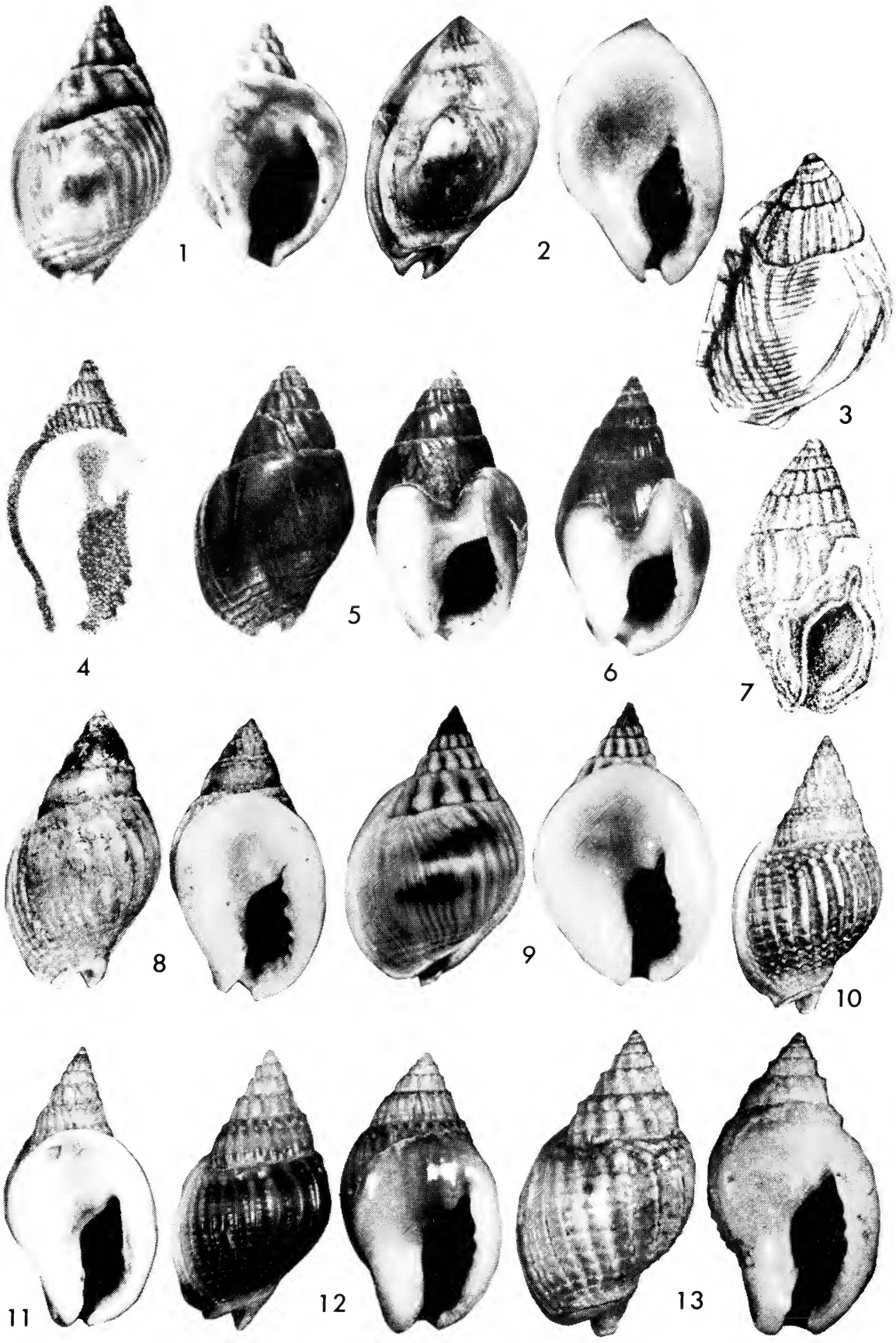
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PLATE 4

Fig. 1. *Nassarius (Plicarcularia) bellulus* (A.Adams). Pondicherry, India; 10.6 mm.

Fig. 2. *N. (P.) bellulus* (A.Adams). Lectotype of *Nassa nana* A.Adams, BM(NH) No. 1973133; 8.2 mm (broad form).

Fig. 3. *N. (P.) elegantissimus* (Shuto). Holotype Kyushu University, NO.GK-L 6565; 10.2 mm (from Shuto, 1969, pl. 13, figs.2,3).

Figs.4,5. *N. (P.) elegantissimus* (Shuto). Pantai Pura, W. Timor, Indonesia; 12.8 and 13.9 mm respectively.

Fig. 6. *N. (P.) bimaculosus* (A.Adams). Lectotype BM(NH) No. 197317; 16.3 mm.

Fig. 7. *N. (P.) bimaculosus* (A.Adams). Geelvink Bay, W. Irian; 16.5 mm.

Fig. 8. *N. (P.) camelus* (v.Martens). Syntype ZMHU; 9.6 mm.

Fig. 9. *N. (P.) camelus* (v.Martens). Nicobar Is; 9.6 mm.

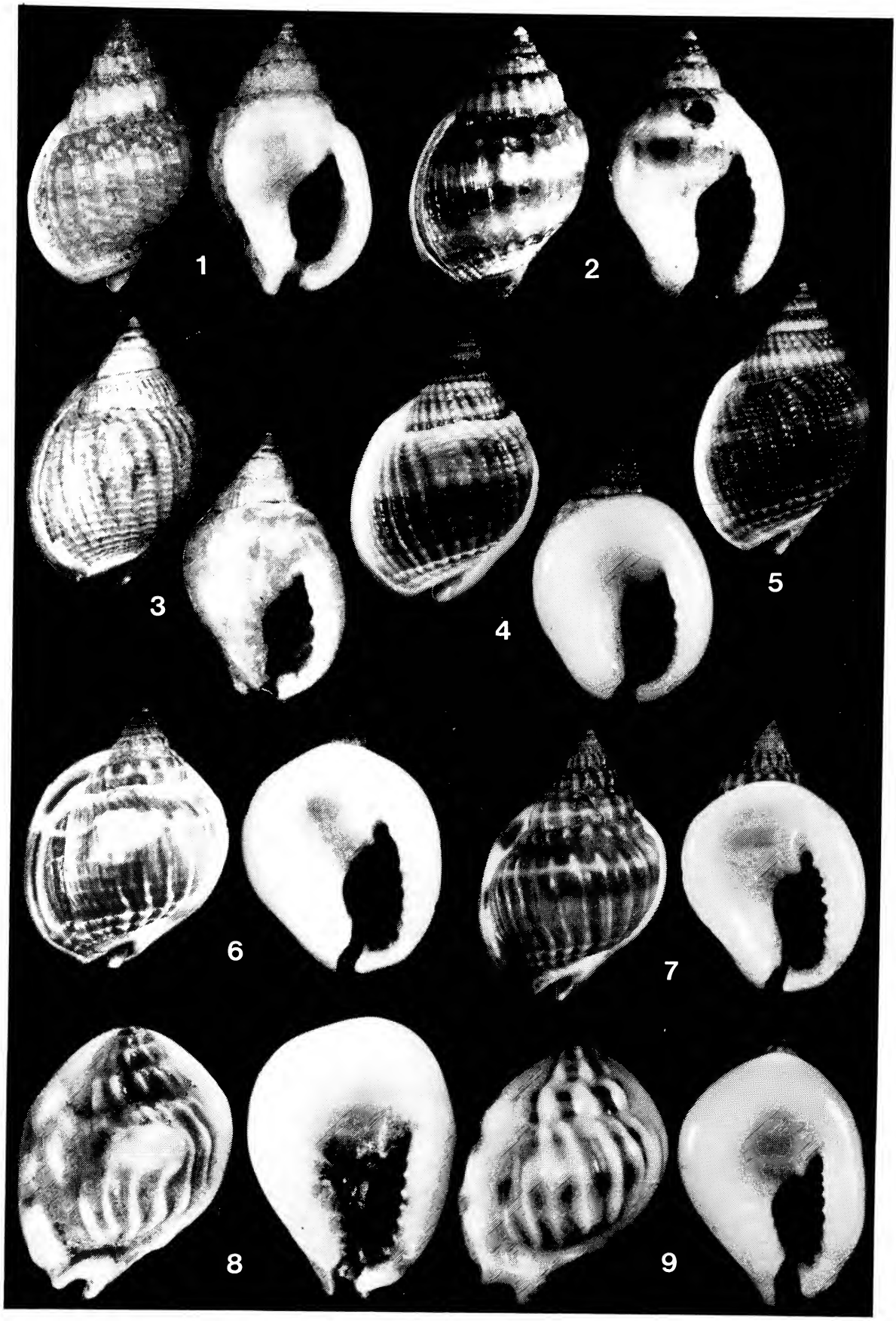
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PLATE 5

Fig. 1. *Nassarius (Plicarcularia) callospira* (A.Adams). Lectotype BM(NH) No. 197319; 11.6 mm.

Fig. 2. *N. (P.) callospira* (A.Adams). Tuki Tuki Pt., Efate I, Vanuatu; 12.2 mm.

Fig. 3. *N. (P.) persicus* (v.Martens). Holotype ZMHU; 20.8 mm.

Fig. 4. *N. (P.) persicus* (v.Martens). Ras Mishab, Persian Gulf; 20.1 mm.

Figs.5,6. *N. (P.) persicus* (v.Martens). Masirah I, Gulf of Oman; 17.2 mm.

Fig. 7. *N. (P.) fissilabris* (A.Adams). Lectotype BM(NH) No.197336; 10.6 mm.

Figs.8,9. *N. (P.) fissilabris* (A.Adams). Sohar, N.W. of Muscat, Oman; 12.5 mm. Smooth form.

Fig. 10. *N. (P.) fissilabris* (A.Adams). Mina Al Fahal, Oman; 12.5 mm. Coarsely sculptured form.

Fig. 11. *N. (P.) fraudulentus* (Marrat). Lectotype Merseyside County Museum, Liverpool; 9.7 mm.

Fig. 12. *N. (P.) fraudulentus* (Marrat). Lizard I, Qld., Australia; 9.9 mm.

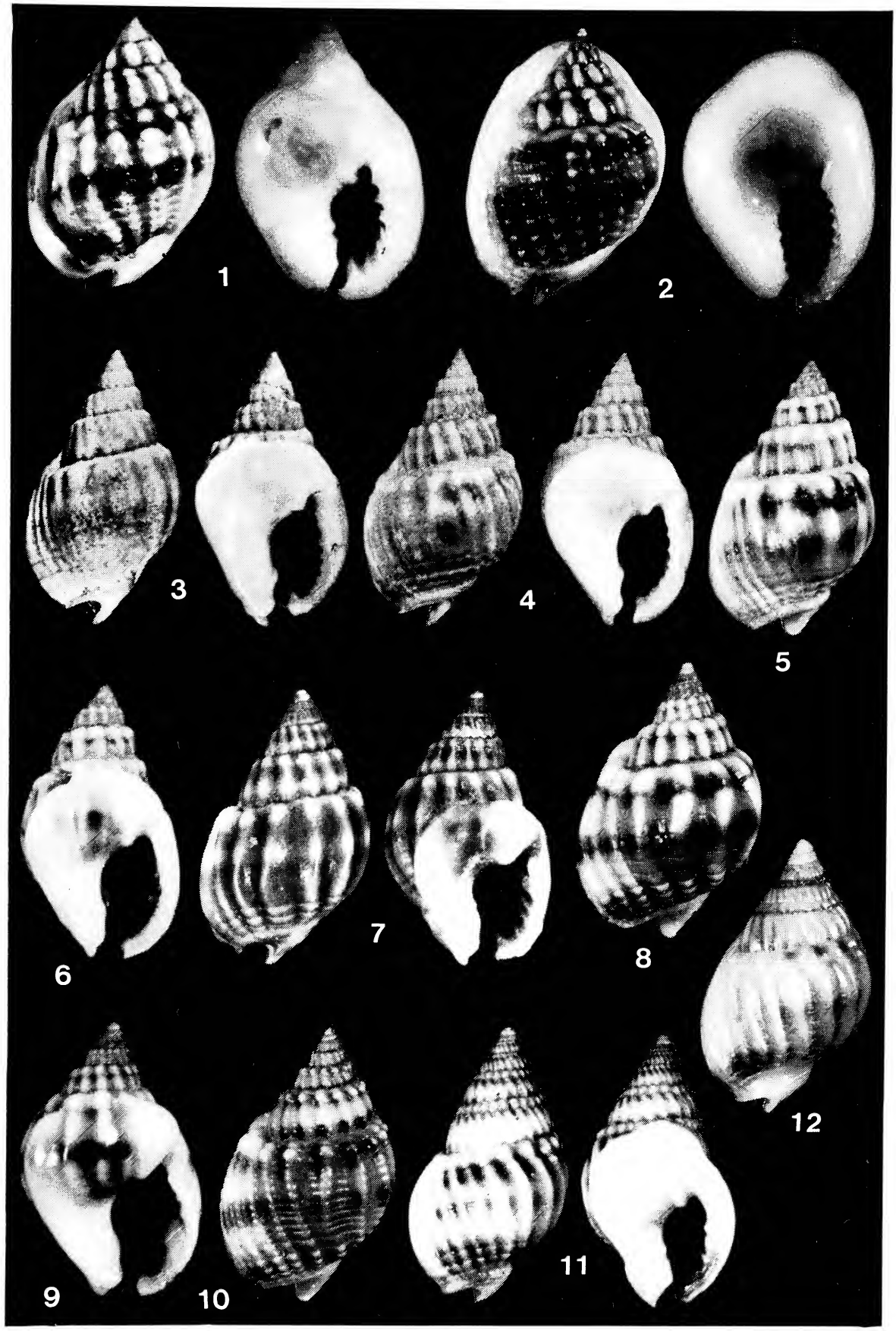
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PLATE 6

Fig. 1. *Nassarius (Plicarcularia) fraudulentus* (Marrat). Mataiea, Tahiti, Society Is; 6.7 mm.

Fig. 2. *N. (P.) maccauslandi* sp. n. Holotype AIM NO. TM-1369; 6.9 mm.

Figs.3,4. *N. (P.) maccauslandi* sp. n. Paratypes 6.5 mm and 6.1 mm respectively.

Fig. 5. *N. (P.) kraussianus* (Dunker). Holotype ZMHU; 8.6 mm.

Fig. 6. *N. (P.) kraussianus* (Dunker). Holotype of *Nassa orbiculata* A.Adams, BM(NH) No. 1973132; 9.0 mm.

Fig. 7. *N. (P.) globosus* (Quoy & Gaimard). Lectotype MNHNP; 12.9 mm. Granulose form.

Fig. 8. *N. (P.) globosus* (Quoy & Gaimard). Holotype of *Plicarcularia gibbosuloidea* Habe & Kosuge, NSMT No. 38621; 12.0 mm. Smooth form.

Fig. 9. *N. (P.) globosus* (Quoy & Gaimard). Marau Sound, Solomon Is; 10.3 mm. Specimen with only spiral sculpture on body whorl.

Fig. 10. *N. (P.) globosus* (Quoy & Gaimard). Tuki Tuki Pt., Efate I, Vanuatu; 11.9 mm. Smooth form.

Fig. 11. *N. (P.) oneratus* (Deshayes). Syntype École des Mines, Paris, No. 6546; 14.5 mm.

Figs.12,13. *N. (P.) oneratus* (Deshayes). Nth Tipalao, Guam I, Marianas Is; 15.0 mm (Fig. 14 = lateral view showing labial hook).

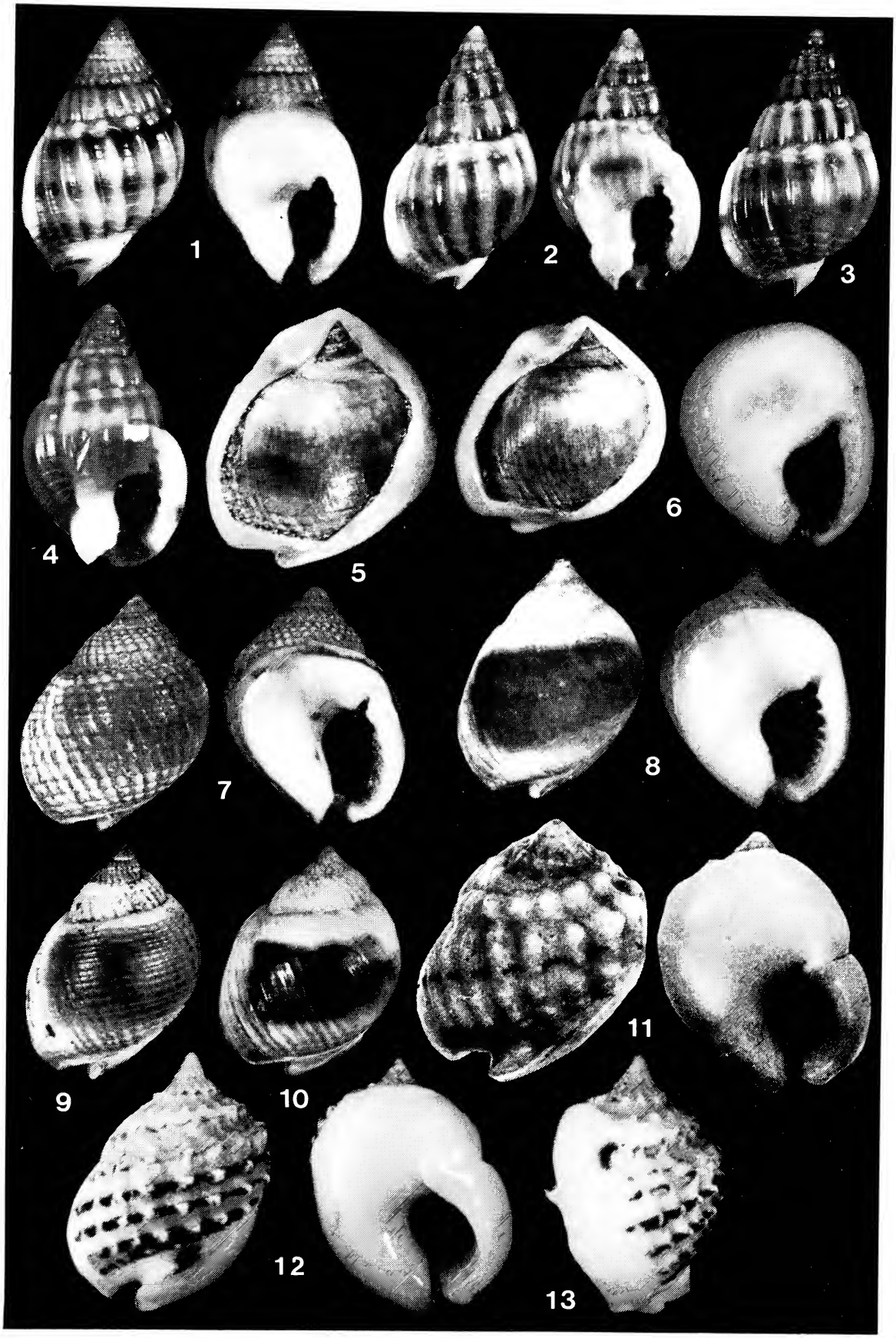
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PLATE 7

Fig. 1. *Nassarius (Plicarcularia) granifer* (Kiener). Type-figure (from Kiener, 1834-41, pl.27, fig.111).

Fig. 2. *N. (P.) granifer* (Kiener). Moorea I, Society Is; 19.1 mm.

Fig. 3. *N. (Niotha) conoidalis* (Deshayes). Lectotype École des Mines, Paris; 19.1 mm.

Fig. 4. *N. (N.) conoidalis* (Deshayes). Lectotype of *Nassa variegata* A.Adams, BM(NH) No. 1973121; 17.3 mm.

Fig. 5. *N. (N.) conoidalis* (Deshayes). Holotype of *Nassa verrucosa* A.Adams, BM(NH) No. 1973120; 23.4 mm. Coarsely sculptured form.

Fig. 6. *N. (N.) conoidalis* (Deshayes). Holotype of *Nassa cumingii* A.Adams, BM(NH) No. 1962914; 25.3 mm.

Fig. 7. *N. (N.) conoidalis* (Deshayes). Holotype of *Nassa ringens* Reeve, BM(NH) No. 1973166; 15.3 mm. Juvenile specimen.

Fig. 8. *N. (N.) conoidalis* (Deshayes). Type-figure of *Nassa rajaensis* K.Martin (from K.Martin, 1895, pl.17, fig.238).

Fig. 9. *N. (N.) conoidalis* (Deshayes). Holotype of *Niotha comtessei* Iredale, AMS No. C-57847; 30.4 mm.

Fig. 10. *N. (N.) conoidalis* (Deshayes). Holotype of *Nassa labordei* Mari, Inst.R.Sci.Nat.Belg.,Brussels; 30.0 mm. Coarsely sculptured form.

Fig. 11. *N. (N.) albescens albescens* (Dunker). Lectotype ZMHU; 14.5 mm.

Fig. 12. *N. (N.) albescens albescens* (Dunker). Lectotype of *Nassa retecosa* A.Adams, BM(NH) No. 1973119; 20.3 mm. Immature specimen.

Fig. 13. *N. (N.) desmoulioides* (Sowerby). Lectotype BM(NH) No. 1903.7.27.80.2; 21.4 mm.

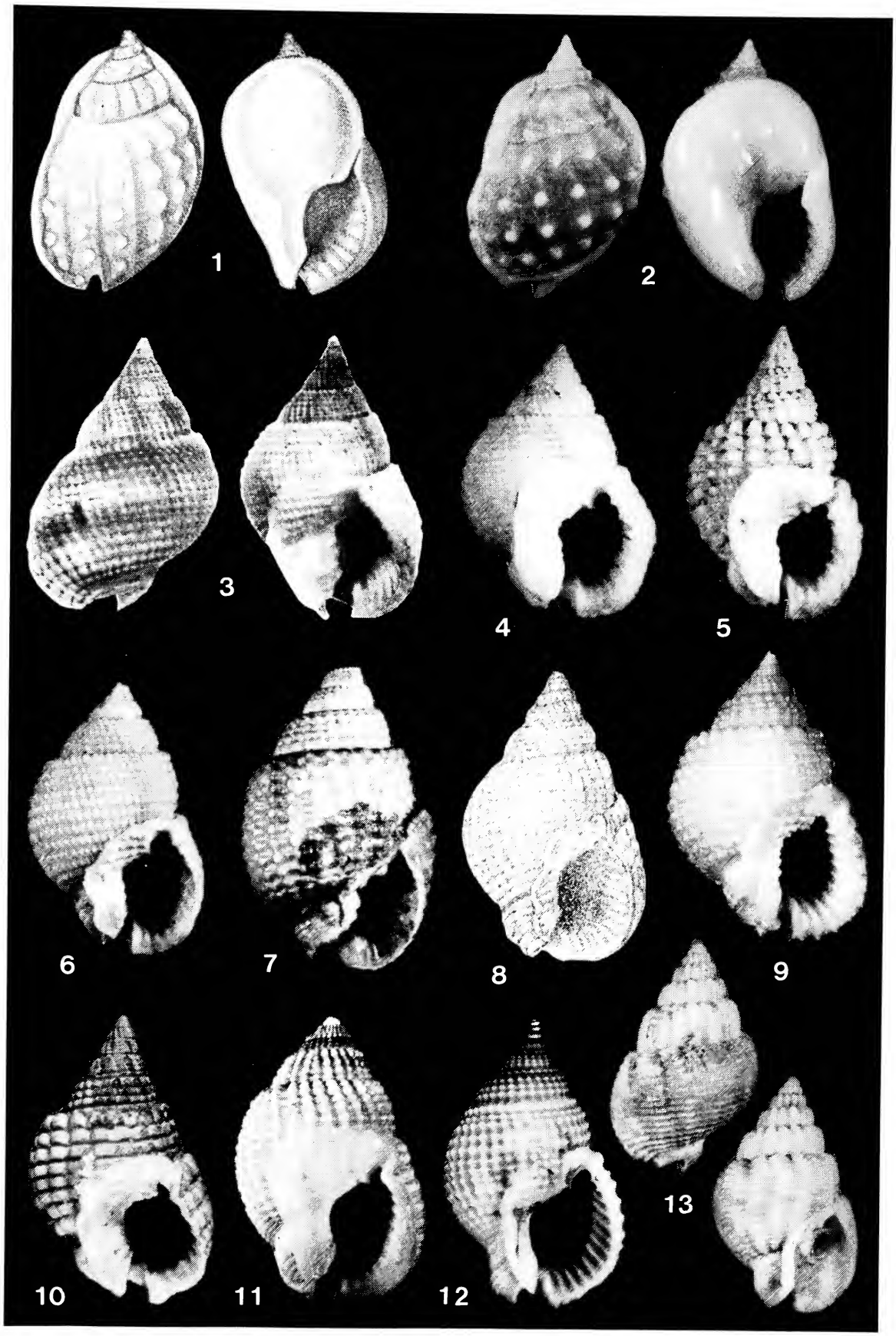
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PLATE 8

Fig. 1. *Nassarius (Niotha) albescens albescens* (Dunker). Pulau Putri, Indonesia; 16.3 mm.

Fig. 2. *N. (N.) albescens gemmuliferus* (A.Adams). Lectotype BM(NH) No. 197338; 11.7 mm.

Fig. 3. *N. (N.) albescens gemmuliferus* (A.Adams). Holotype of *Nassa gestroi* Bisacchi, Mus.Civ.Stor. Nat.Genova; 14.0 mm.

Fig. 4. *N. (N.) albescens gemmuliferus* (A.Adams). Lagon de la Saline, Reunion I; 19.0 mm.

Figs.5,6. *N. (N.) candens* (Hinds). Lectotype BM(NH) No. 1844.9.23.1; 20.0 mm.

Fig. 7. *N. (N.) candens* (Hinds). Bay N.W. of Tahuata, Marquesas Is; 16.9 mm.

Figs.8,9. *N. (N.) splendidulus* (Dunker). Syntypes ZMHU; 15.8 mm and 10.9 mm respectively.

Fig. 10. *N. (N.) splendidulus* (Dunker). Holotype of *Nassa stigmaria* A.Adams, BM(NH) No. 1973117; 20.2 mm.

Fig. 11. *N. (N.) splendidulus* (Dunker). Lectotype of *Nassa densigranata* Reeve, BM(NH) No. 197333; 13.1 mm.

Fig. 12. *N. (N.) splendidulus* (Dunker). Lectotype of *Nassa granulosa* Marrat, Merseyside County Museum, Liverpool; 9.8 mm.

Fig. 13. *N. (N.) splendidulus* (Dunker). Lectotype of *Nassa nivosa* Marrat, Merseyside County Museum, Liverpool; 11.6 mm.

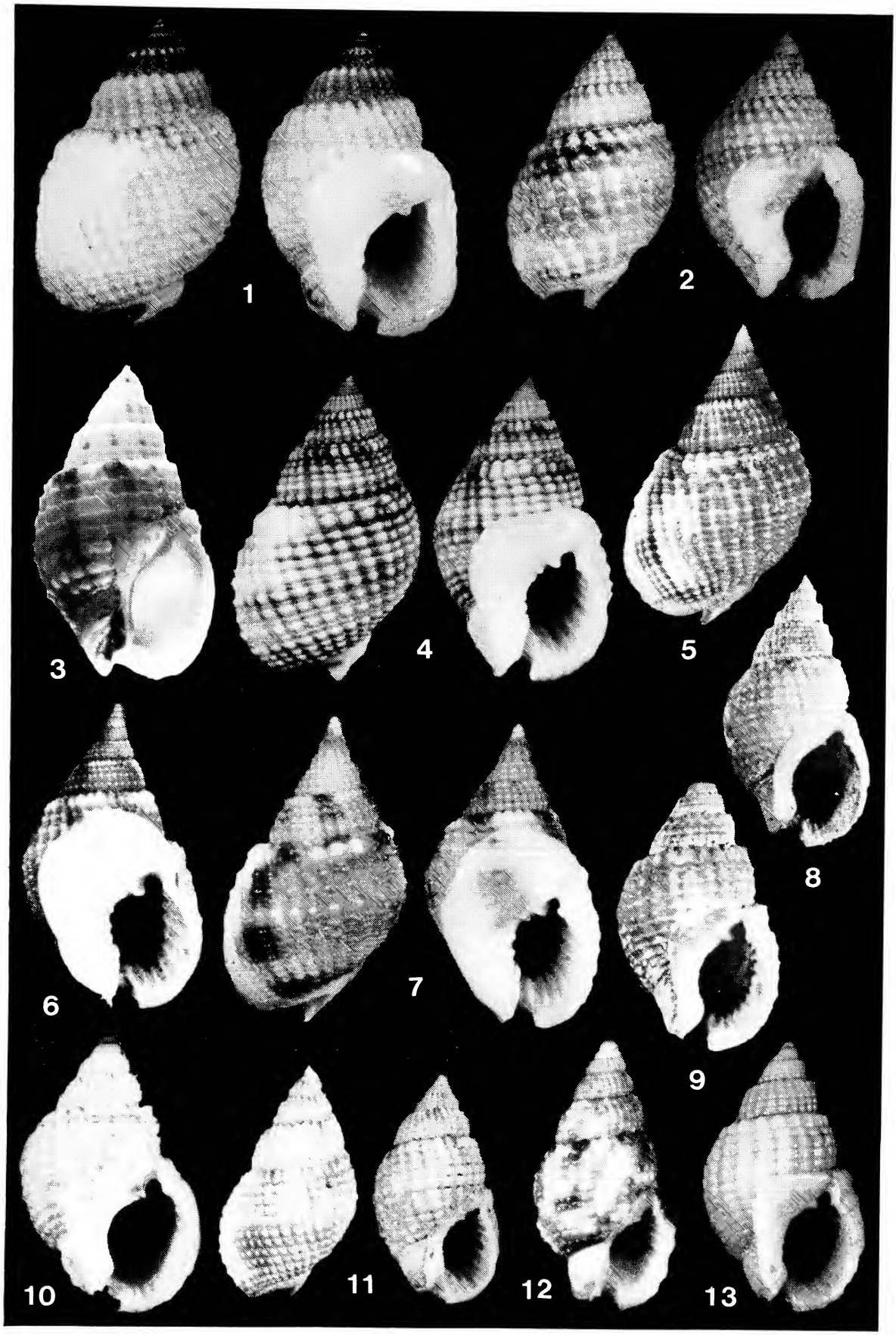
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PLATE 9

Fig. 1. *Nassarius (Niotha) splendidulus* (Dunker). Holotype of *Nassa praecallosa* Marrat, Merseyside County Museum, Liverpool; 11.6 mm. Specimen with an abnormally large callus-shield.

Fig. 2. *N. (N.) splendidulus* (Dunker). Holotype of *Niotha hawleyi* Iredale, AMS No. C-60689; 13.7 mm.

Fig. 3. *N. (N.) novaezelandiae* (Reeve). Lectotype BM(NH) No. 197353; 13.0 mm.

Fig. 4. *N. (N.) novaezelandiae* (Reeve). Lectotype of *Nassa bifaria* Baird in Brenchley, BM(NH) No. 1973176; 14.9 mm.

Fig. 5. *N. (N.) novaezelandiae* (Reeve). Efate I, Vanuatu; 12.9 mm. Granulose form.

Fig. 6. *N. (N.) novaezelandiae* (Reeve). Efate I, Vanuatu; 14.5 mm. Smoother form *bifaria* Baird.

Fig. 7. *N. (N.) bellus* (Marrat). Holotype Merseyside County Museum, Liverpool, 12.3 mm.

Fig. 8. *N. (N.) bellus* (Marrat). Holotype of *Nassa angriasensis* Melvill & Standen, BM(NH) No. 1901.12.9.136; 10.4 mm.

Fig. 9. *N. (N.) bellus* (Marrat). Holotype of *Nassa perligera* Thiele, ZMHU; 9.5 mm.

Figs.10,11. *N. (N.) bellus* (Marrat). Lombok, Indonesia; 9.2 mm.

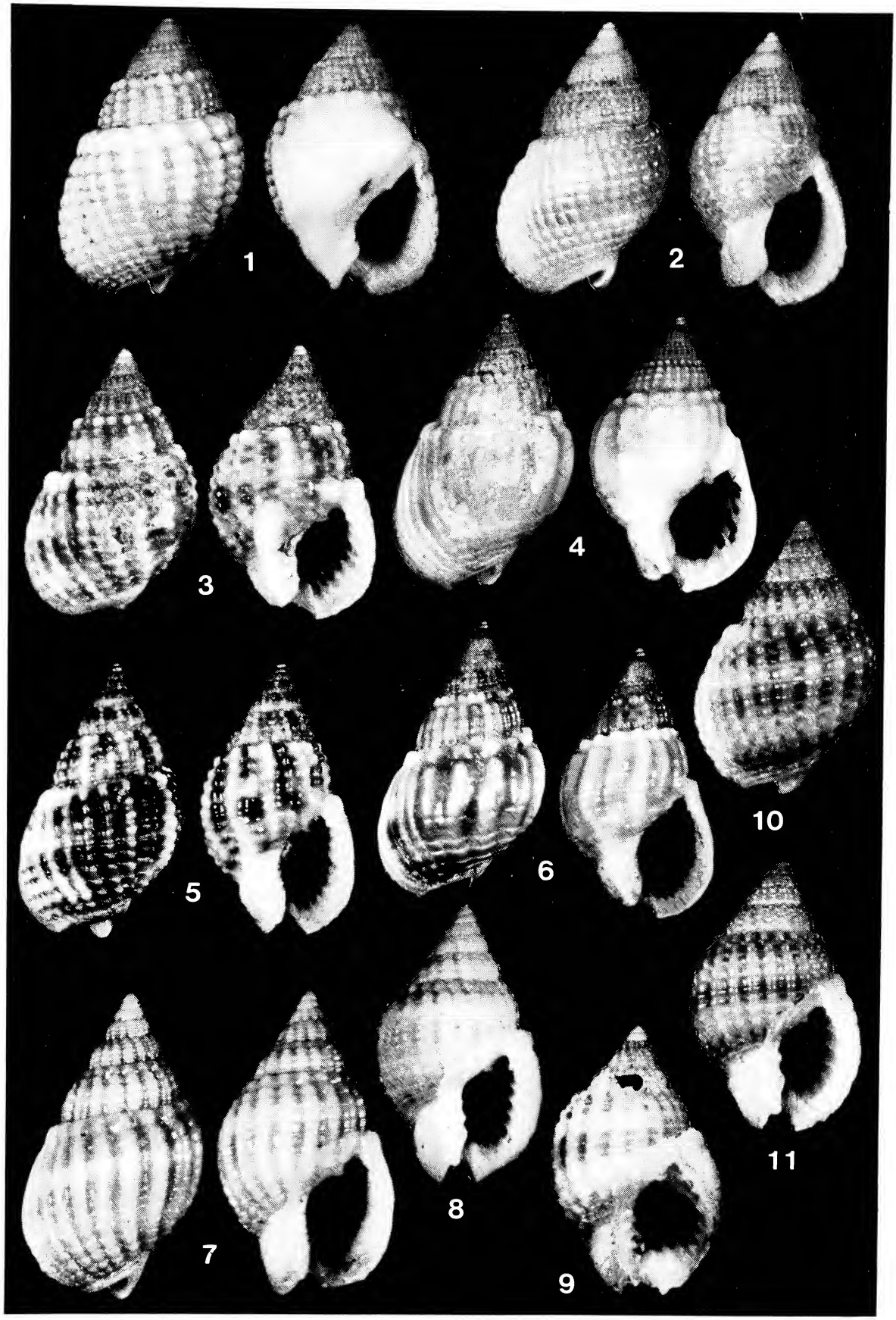
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PLATE 10

Fig. 1. *Nassarius (Niotha) livescens* (Philippi). Illustration from Lischke, 1871, pl.4, figs.1,2.

Fig. 2. *N. (N.) livescens* (Philippi). Lectotype of *Nassa sordida* A.Adams, BM(NH) No. 1973124; 13.4 mm.

Figs.3,4. *N. (N.) livescens* (Philippi). Lectotype (Fig.3) and paralectotype (Fig.4) of *Nassa marginulata* Reeve, *N.kieneri* Deshayes, and *N.secluza* Fischer, BM(NH); 19.0 mm and 20.2 mm respectively.

Fig. 5. *N. (N.) livescens* (Philippi). Lectotype of *Nassa margaritifera* Reeve and *N.provulgata* Fischer, BM(NH); 26.4 mm.

Fig. 6. *N. (N.) livescens* (Philippi). Holotype of *Nassa deshayesii* Rousseau, MNHNP; 25.0 mm.

Fig. 7. *N. (N.) livescens* (Philippi). Holotype of *Nassa oblonga* Marrat, Merseyside County Museum, Liverpol; 25.0 mm.

Fig. 8. *N. (N.) livescens* (Philippi). Lectotype of *Nassa keenii* Marrat, Merseyside County Museum, Liverpool; 13.0 mm.

Fig. 9. *N. (N.) livescens* (Philippi). Holotype of *Nassa lyraeformis* Marrat, Merseyside County Museum, Liverpool; 22.4 mm.

Fig. 10. *N. (N.) livescens* (Philippi). Lectotype of *Nassa quadrata* Marrat, Merseyside County Museum, Liverpool; 20.2 mm.

Fig. 11. *N. (N.) livescens* (Philippi). Holotype of *Nassa granosocostata* Schepman, ZMA; 16.2 mm.

Fig. 12. *N. (N.) livescens* (Philippi). Holotype of *Nassarius fulleri* MacNeil, USNM-562949; 15.0 mm.

Fig. 13. *N. (N.) nodifer* (Powys). Lectotype BM(NH) No. 197367; 31.4 mm.

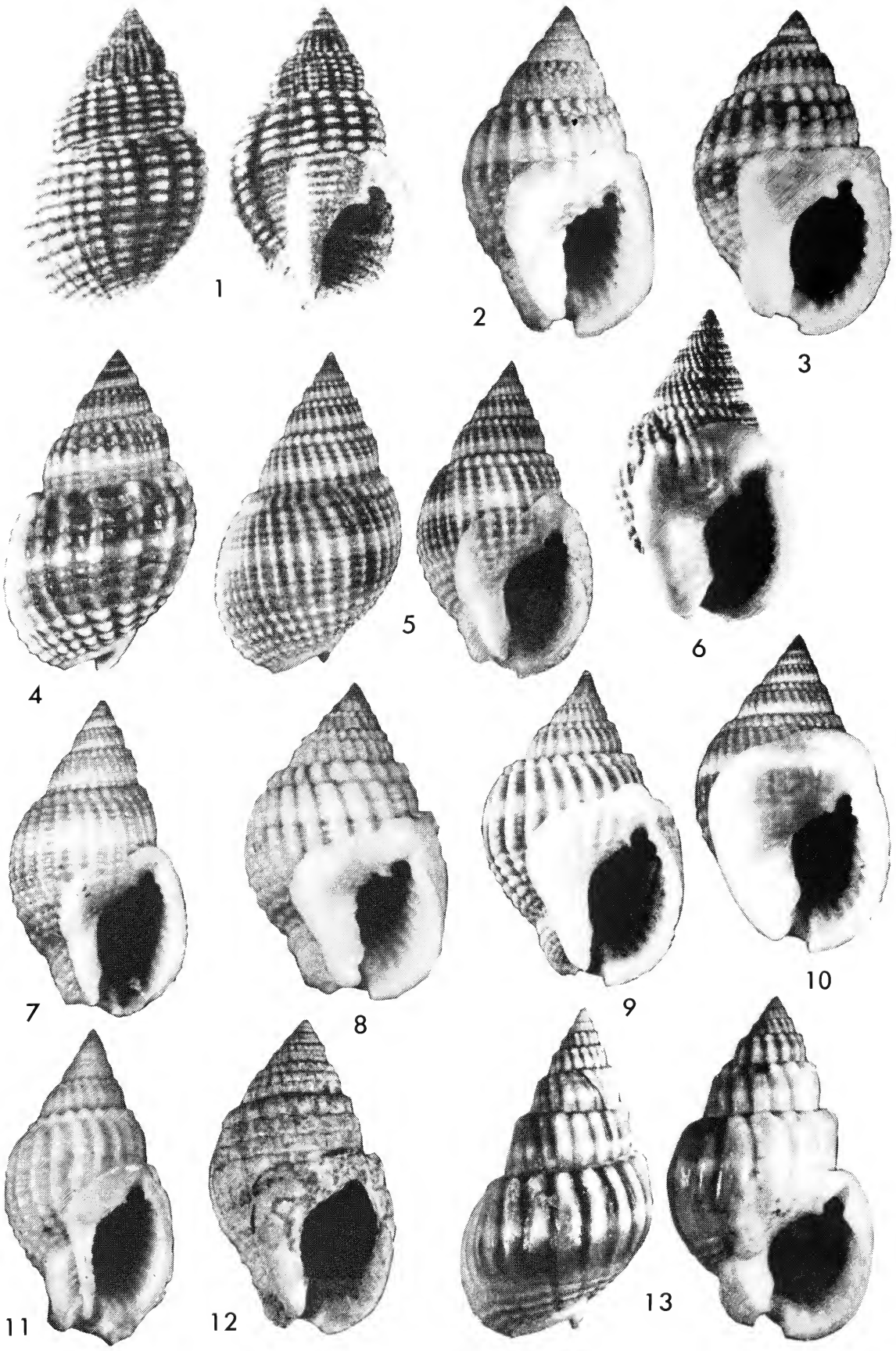
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PLATE 11

Fig. 1. *Nassarius (Niotha) nodifer* (Powys). Holotype of *Nassa stolida* A.Adams, BM(NH) No. 1973137; 31.3 mm. Pathological specimen.

Fig. 2. *N. (N.) nodifer* (Powys). Holotype of *Nassa stoliczkana* G. & H.Nevill, ZSI; 10.2 mm. Juvenile specimen.

Fig. 3. *N. (N.) nodifer* (Powys). Tanjon Rhu, Kedah, Malaysia; 27.8 mm.

Fig. 4. *N. (N.) venustus* (Dunker). Holotype ZMHU; 17.7 mm.

Fig. 5. *N. (N.) venustus* (Dunker). Sanur Beach, Bali, Indonesia; 21.0 mm.

Fig. 6. *N. (N.) deshayesianus* (Issel). Holotype Mus.Civ.Stor.Nat.Genova; 18.0 mm.

Fig. 7. *N. (N.) deshayesianus* (Issel). Holotype of *Phrontis obockensis* Jousseaume, MNHNP; 11.0 mm.

Fig. 8. *N. (N.) deshayesianus* (Issel). Holotype of *Nassa zailensis* Sowerby, BM(NH) No. 1895.4.29.182; 14.8 mm. Immature specimen.

Fig. 9. *N. (N.) deshayesianus* (Issel). Type-figure of *Nassa andamanica* Melvill & Sykes (from Melvill & Sykes, 1898, textfig. 4).

Fig. 10. *N. (N.) deshayesianus* (Issel). Andaman Is; 18.0 mm.

Fig. 11. *N. (N.) acuticostus* (Montrouzier). Type-figure (from Souverbie & Montrouzier, 1864, pl.10, fig.8).

Fig. 12. *N. (N.) acuticostus* (Montrouzier). Daea, S. coast of Morotai, Indonesia; 16.2 mm.

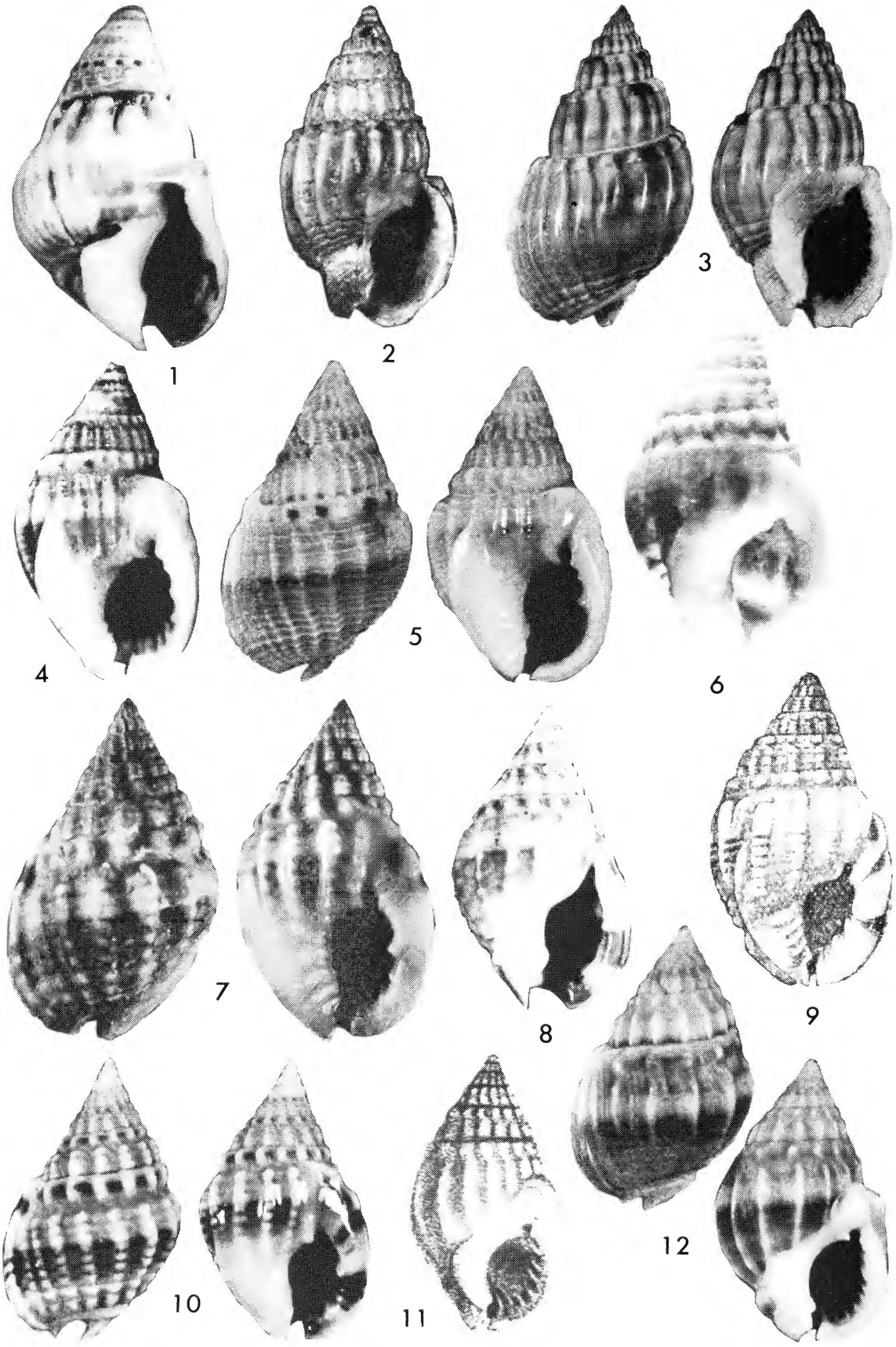
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PLATE 12

Fig. 1. *Nassarius (Niotha) semisulcatus* (Rousseau). Holotype MNHNP; 17.2 mm.

Fig. 2. *N. (N.) semisulcatus* (Rousseau). Bolo Pt., Okinawa, Ryukyu Is; 16.5 mm.

Fig. 3. *N. (N.) natalensis* (E.A.Smith). Holotype BM(NH) No. 1899.4.14.493.; 21.4 mm.

Fig. 4. *N. (N.) natalensis* (E.A.Smith). Chakas Rock, Umhlali, Natal, Sth. Africa; 19.8 mm.

Fig. 5. *N. (N.) distortus* (A.Adams). Type-figure of *Buccinum monile* Kiener (from Kiener 1834-41, pl.11, fig.40).

Fig. 6. *N. (N.) distortus* (A.Adams). Lectotype BM(NH) No. 197334; 23.5 mm.

Fig. 7. *N. (N.) distortus* (A.Adams). Holotype of *Nassa lachrymosa* Reeve, BM(NH) No.197343; 26.4 mm.

Fig. 8. *N. (N.) distortus* (A.Adams). Malapoa Pt., Efate I, Vanuatu; 25.7 mm.

Fig. 9. *N. (N.) stolatus* (Gmelin). Illustrated lectotype (from Martini & Chemnitz, 1780, pl.124, figs.1167, 1168).

Fig. 10. *N. (N.) stolatus* (Gmelin). Type-figure of *Buccinum ornatum* Kiener (from Kiener, 1834-41, pl.21, fig.83).

Fig. 11. *N. (N.) stolatus* (Gmelin). Batu Ferringhi, Penang, Malaysia; 19.5 mm.

Fig. 12. *N. (N.) stolatus* (Gmelin). Madras, India; 22.0 mm.

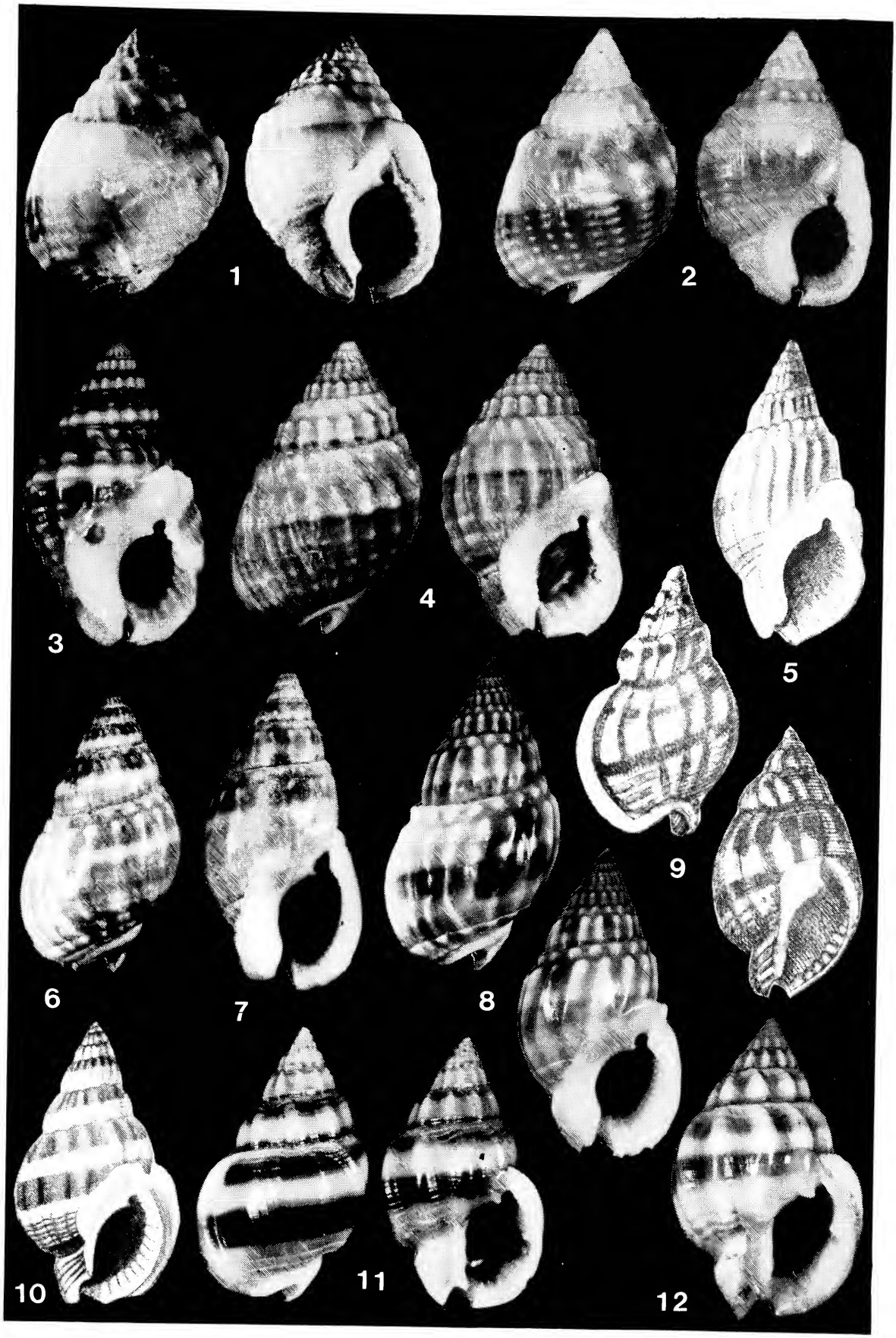
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PLATE 13

Fig. 1. *Nassarius (Niotha) jacksonianus* (Quoy & Gaimard). Type-figure (from Quoy & Gaimard, 1833, pl.32, figs. 28,29).

Fig. 2. *N. (N.) jacksonianis* (Quoy & Gaimard). Lectotype of *Nassa harpularia* Marrat, Merseyside County Museum, Liverpool; 12.0 mm.

Fig. 3. *N. (N.) jacksonianus* (Quoy & Gaimard). Holotype of *Nassa siva* Preston, BM(NH) No. 1905.2.8.10; 12.8 mm.

Fig. 4. *N. (N.) jacksonianus* (Quoy & Gaimard). Pulau Langkawi, Kedah, Malaysia; 16.3 mm.

Fig. 5. *N. (N.) festivus* (Powys). Lectotype BM(NH) No. 197365; 18.8 mm.

Fig. 6. *N. (N.) festivus* (Powys). Probable syntype of *Nassa nodata* Hinds, BM(NH) No. 1844.9.23.15.; 17.5 mm.

Fig. 7. *N. (N.) festivus* (Powys). Type-figure of *Nassa bonneti* Cossmann (from Cossmann, 1901, pl.9, fig.18).

Fig. 8. *N. (N.) festivus* (Powys). Holotype of *N.prefestivus* MacNeil, USNM-562953; 11.4 mm.

Fig. 9. *N. (N.) festivus* (Powys). Tai Tan Harbour, Hong Kong; 15.2 mm.

Fig. 10. *N. (N.) coronulus* (A.Adams). Lectotype BM(NH) No. 197324; 14.6 mm.

Fig. 11. *N. (N.) coronulus* (A.Adams). Grand Recif, Tulear, Madagascar; 15.8 mm.

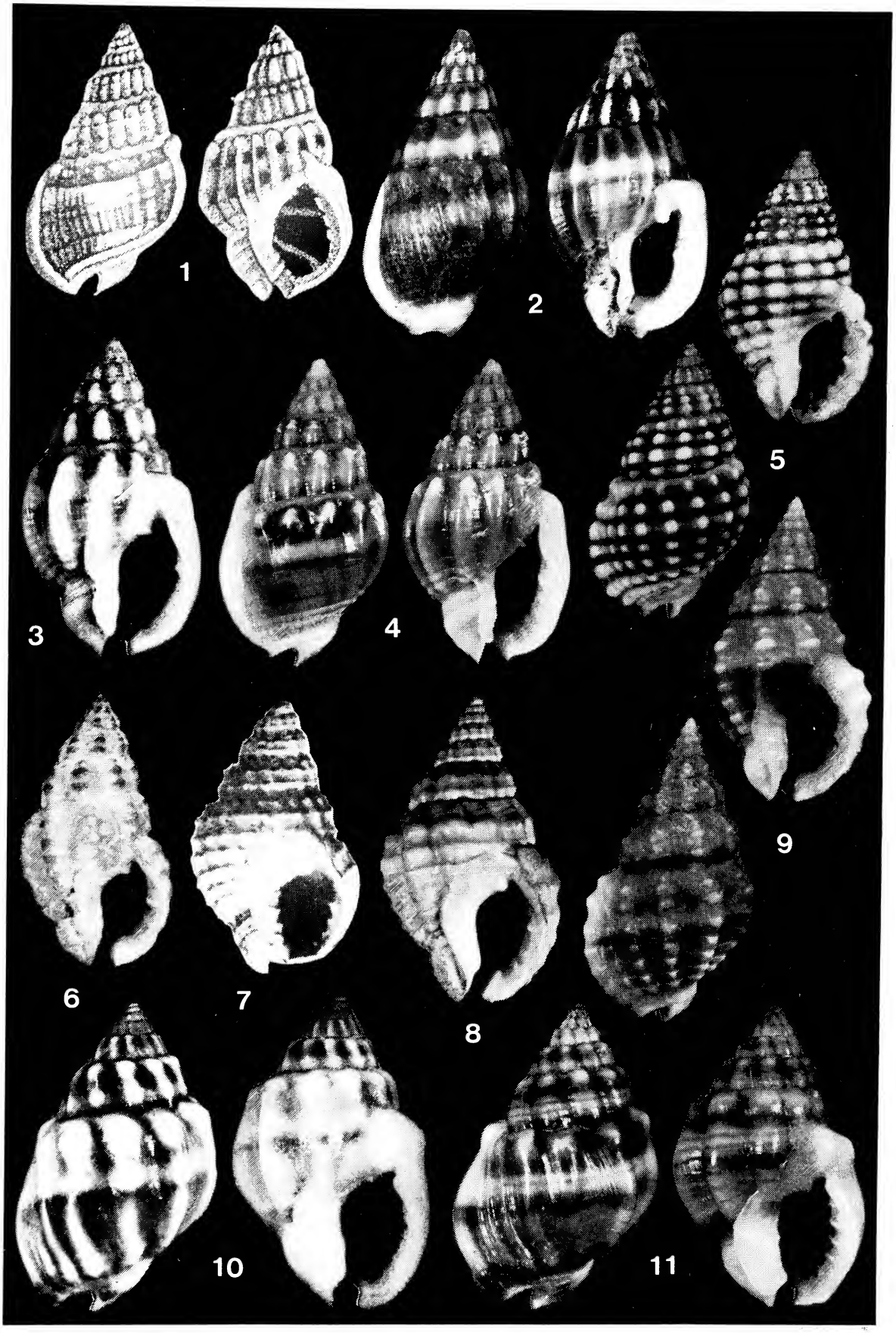
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PLATE 14

Fig. 1. *Nassarius (Niotha) crenoliratus* (A.Adams). Holotype BM(NH) No. 197330; 9.8 mm.

Fig. 2. *N. (N.) crenoliratus* (A.Adams). Bongka I, Sumatra, Indonesia; 10.9 mm. Broad form.

Fig. 3. *N. (N.) crenoliratus* (A.Adams). Phuket, Thailand; 11.3 mm. Slender form.

Fig. 4. *N. (N.) delicatus* (A.Adams). Lectotype BM(NH) No. 197332; 9.8 mm.

Fig. 5. *N. (N.) delicatus* (A.Adams). Holotype of *Nassa nodicostata* A.Adams, BM(NH) No. 1973127; 13.6 mm. Echinate form.

Fig. 6. *N. (N.) delicatus* (A.Adams). Holotype of *Alectryon alcimus* Melvill, BM(NH) No. 1921.1.28.2; 15.0 mm.

Fig. 7. *N. (N.) delicatus* (A.Adams). Java, Indonesia; 7.0 mm. Smooth form.

Fig. 8. *N. (N.) delicatus* (A.Adams). Suva reef, Fiji Is; 9.9 mm. Echinate form.

Fig. 9. *N. (N.) ecstilbus* (Melvill & Standen). Holotype University of Manchester Museum; 9.8 mm.

Fig. 10. *N. (N.) ecstilbus* (Melvill & Standen). Paratype of *Nassa gerstenbrandti* Preston, Inst.R.Sci.Nat.Belg., Brussels; 6.1 mm. Specimen with fewer axial ribs.

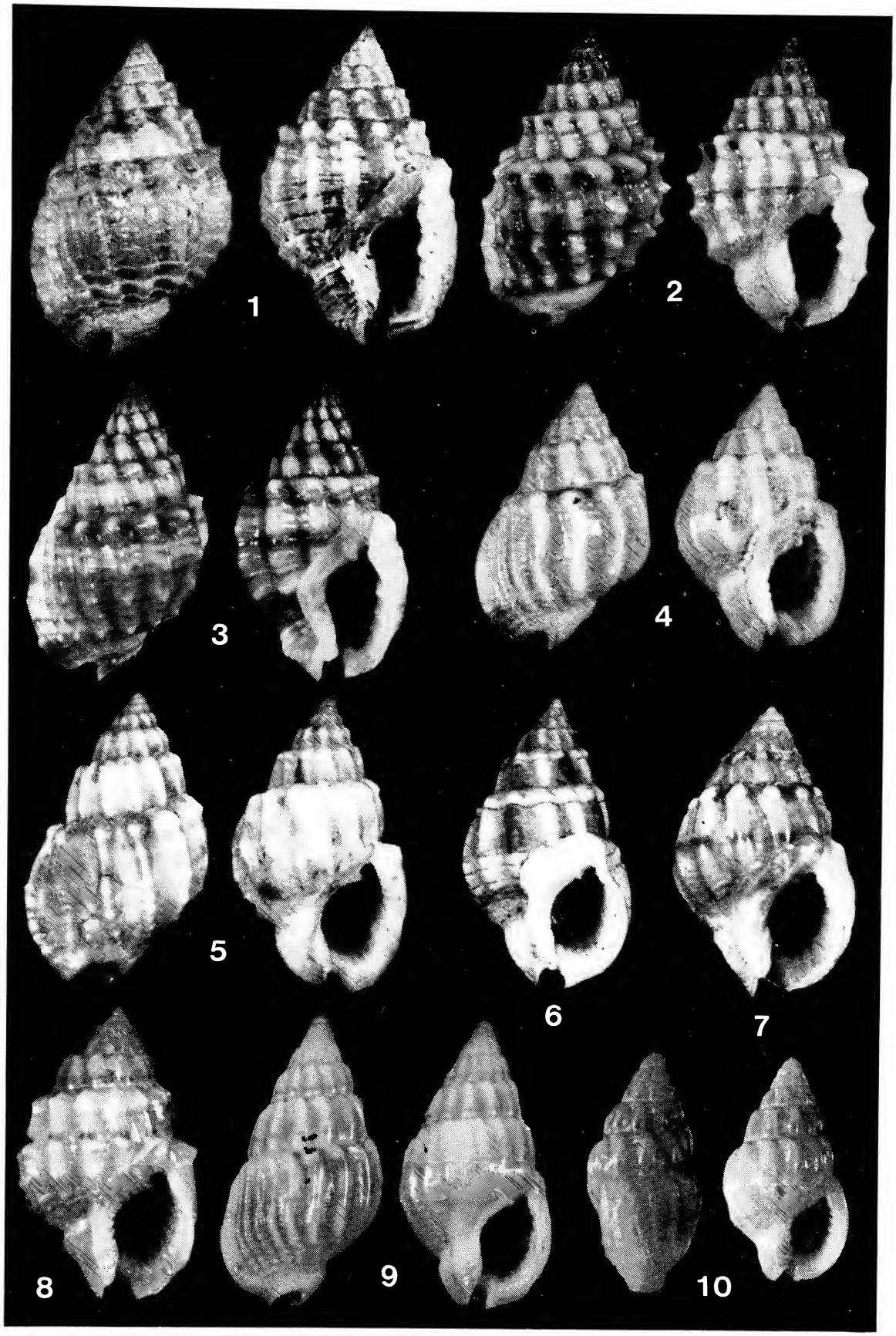
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PLATE 15

Fig. 1. *Nassarius (Niotha) ecstilbus* (Melvill & Standen). Cape Flattery, Lizard I, Qld., Australia; 9.5 mm.

Fig. 2. *N. (N.) fretorum* (Melvill & Standen). Holotype BM(NH) No.1899.2.36.26; 11.5 mm.

Fig. 3. *N. (N.) fretorum* (Melvill & Standen). Lectotype of *Nassa pusio* A.Adams, BM(NH) No. 1973130; 7.8 mm.

Fig. 4. *N. (N.) fretorum* (Melvill & Standen). Holotype of *Nassa ariel* Preston, ZSI No. M-4679/1; 7.4 mm.

Fig. 5. *N. (N.) fretorum* (Melvill & Standen). Punta Engano, Mactan I, Philippines; 7.6 mm and 7.5 mm respectively.

Fig. 6. *N. (N.) obesus* (G. & H.Nevill). Type-figure (from G. & H.Nevill, 1875, pl.8, figs.2,3).

Fig. 7. *N. (N.) obesus* (G. & H.Nevill). Holotype of *Nassa eranea* Melvill & Standen, BM(NH) No. 1901.12.9.160; 12.1 mm.

Fig. 8. *N. (N.) obesus* (G. & H.Nevill). Holotype of *Nassa shawi* Preston, BM(NH); 8.3 mm.

Fig. 9. *N. (N.) jactabundus* (Melvill). Holotype BM(NH) No. 1906.6.13.17; 19.3 mm.

Fig. 10. *N. (N.) jactabundus* (Melvill). Reden near Bushire, Persian Gulf; 11.5 mm.

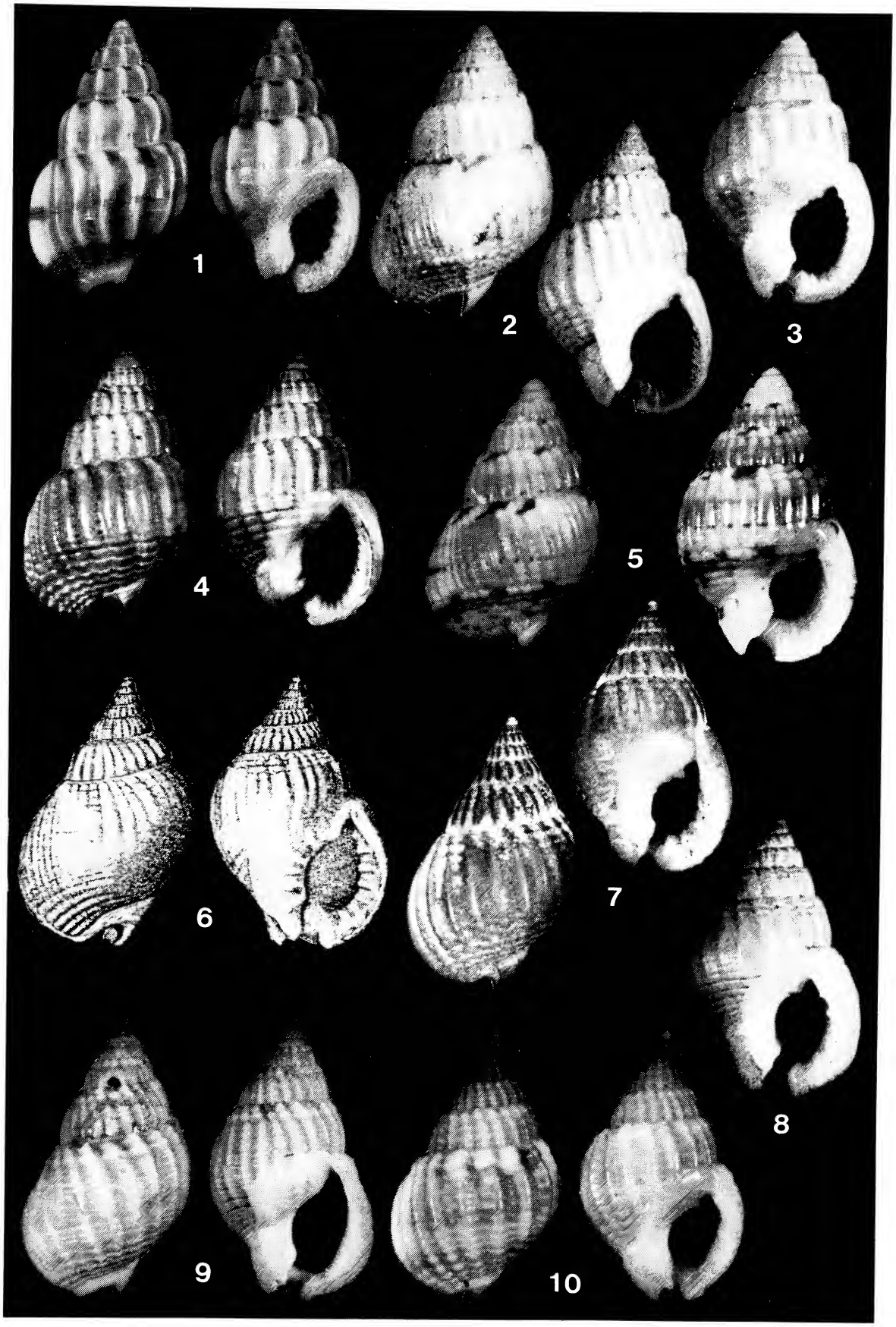
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PLATE 16

Fig. 1. *Nassarius (Niotha) sinusigerus* (A.Adams). Lectotype BM(NH) No. 1973128; 11.7 mm.

Fig. 2. *N. (N.) sinusigerus* (A.Adams). Holotype of *Nassa beata* Gould, USNM No. C-2018; 10.4 mm.

Fig. 3. *N. (N.) sinusigerus* (A.Adams). Holotype of *Nassa phoenicensis* Preston, ZSI No. M-9807/2; 7.2 mm.

Fig. 4. *N. (N.) sinusigerus* (A.Adams). Holotype of *Nassa collaticia* Melvill & Standen, BM(NH) No. 1901.12.9.157; 8.2 mm.

Fig. 5. *N. (N.) sinusigerus* (A.Adams). Lectotype of *Nassa abyssinica* Marrat, Merseyside County Museum, Liverpool; 8.1 mm.

Fig. 6. *N. (N.) sinusigerus* (A.Adams). Holotype of *Nassarius greyanus* Shuto, Kyushu University, Sendai; 10.5 mm (from Shuto, 1969, pl.14,figs. 1,3).

Fig. 7. *N. (N.) sinusigerus* (A.Adams). Type-figure of *Nassa aracanensis* E.A.Smith (from Annandale & Stewart, 1901, pl.11,fig.2.).

Fig. 8. *N. (N.) sinusigerus* (A.Adams). Side-view. Lombok, Indonesia; 9.5 mm.

Fig. 9. *N. (N.) sinusigerus* (A.Adams). Port Moresby, Papua New Guinea; 9.2 mm.

Fig. 10. *N. (N.) sinusigerus* (A.Adams). Off Ganges Delta, India; 6.9 mm. Squat form.

Fig. 11. *N. (N.) albinus* (Thiele). Lectotype, ZMHU; 10.5 mm.

Fig. 12. *N. (N.) albinus* (Thiele). Northwest Cape, West Australia; 11.9 mm.

Figs.13,14. *N. (N.) rehderi* Cernohorsky. Holotype AIM No.TM-1366; 7.8 mm.

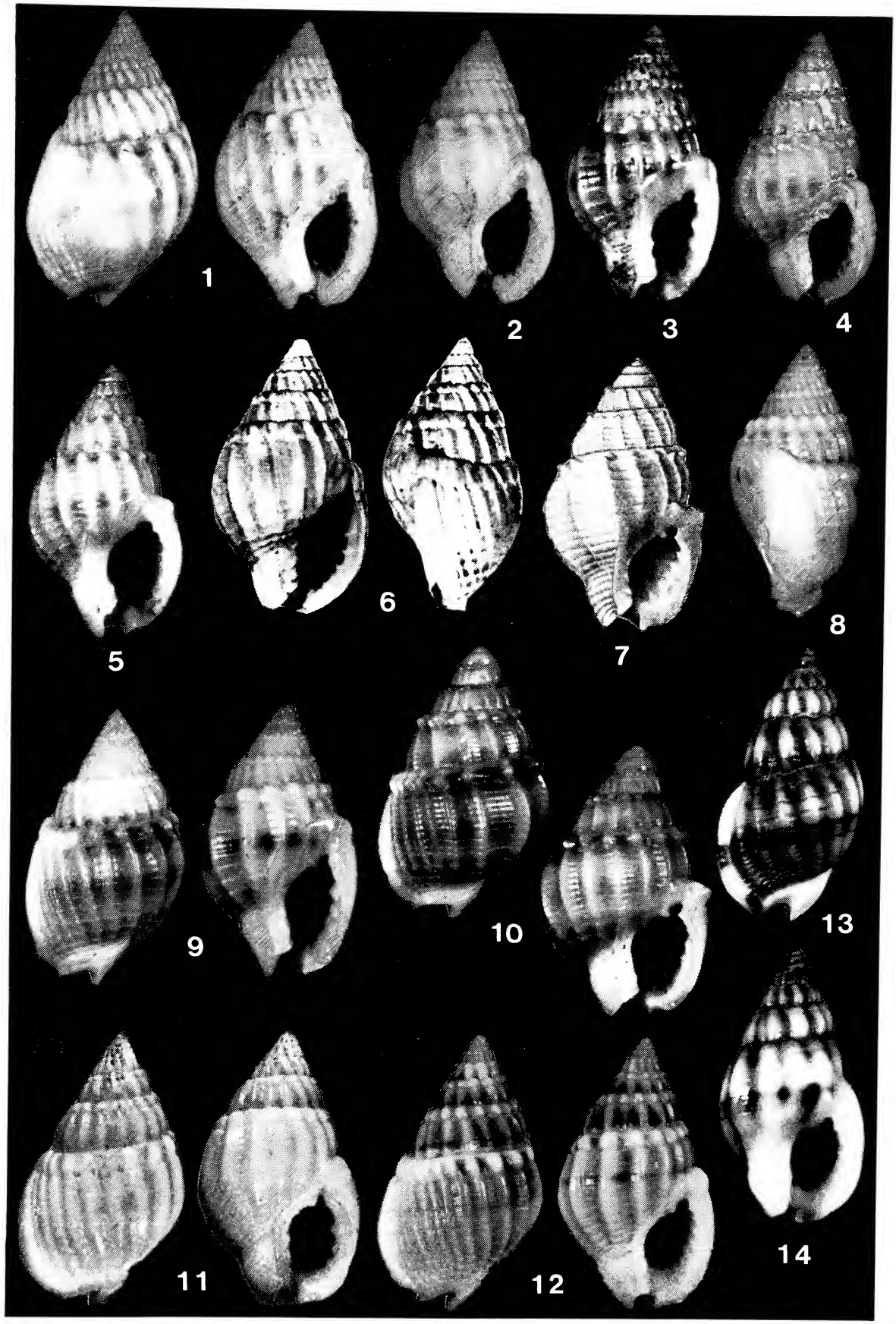
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PLATE 17

Fig. 1. *Nassarius (Niotha) rehderi* Cernohorsky. Paratype from Baie de Matavai, Tahiti; 7.0 mm.

Fig. 2. *N. (N.) himeroessa* (Melvill & Standen). Lectotype BM(NH) No. 1903.12.15.69.; 4.4 mm.

Fig. 3. *N. (N.) himeroessa* (Melvill & Standen). Lectotype of *Nassa innocens* Thiele, ZMHU; 6.3 mm.

Fig. 4. *N. (N.) himeroessa* (Melvill & Standen). Off Kenya, E. Africa, 300 m; 5.7 mm.

Fig. 5. *N. (N.) agapetus* (Watson). Holotype BM(NH) No. 1887.2.9.590; 5.7 mm.

Fig. 6. *N. (N.) agapetus* (Watson). Holotype of *Nassa kempi* Preston, ZSI; 4.4 mm.

Fig. 7. *N. (N.) agapetus* (Watson). Off Bali, Indonesia, 70 m; 6.1 mm.

Fig. 8. *N. (N.) quadrasi* (Hidalgo). Lectotype BM(NH) No. 197132; 15.1 mm.

Fig. 9. *N. (N.) quadrasi* (Hidalgo). Sogi, Apia, W.Samoa; 13.2 mm.

Fig. 10. *N. (N.) echinatus* (A.Adams). Lectotype BM(NH) No. 197131; 14.0 mm.

Fig. 11. *N. (N.) echinatus* (A.Adams). Nordup, New Britain, Papua New Guinea; 13.5 mm.

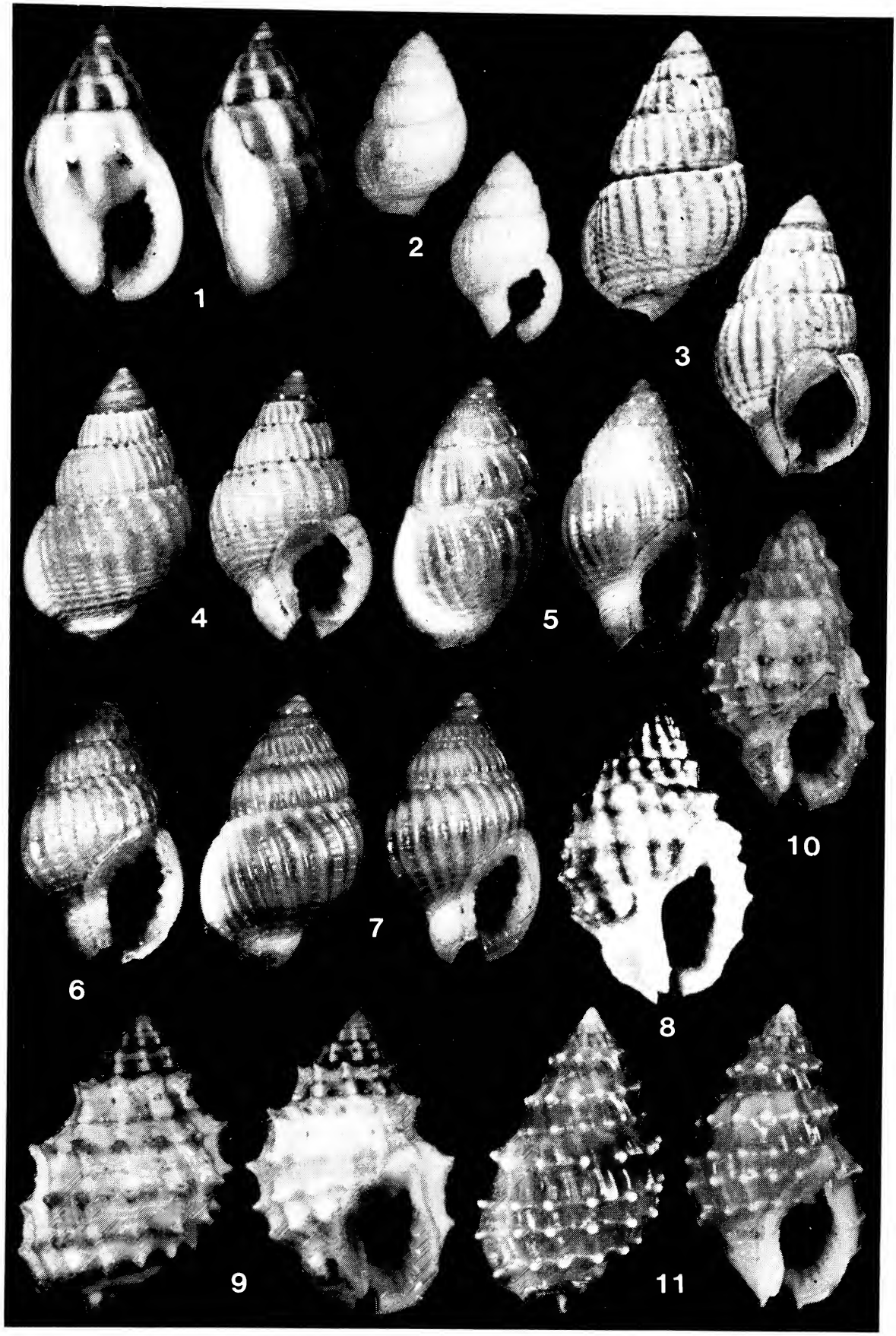
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PLATE 18

Fig. 1. *Nassarius (Niotha) gruneri* (Dunker). Probable syntype ZMHU; 15.2 mm.

Fig. 2. *N. (N.) gruneri* (Dunker). Lectotype of *Nassa acinosa* Gould, USNM-5725; 16.3 mm.

Fig. 3. *N. (N.) gruneri* (Dunker). Lectotype of *Nassa hispida* A.Adams, BM(NH) No. 197341; 20.0 mm.

Fig. 4. *N. (N.) gruneri* (Dunker). Holotype of *Nassa fragum* Rousseau, MNHNP 19.1 mm. Slender form.

Fig. 5. *N. (N.) gruneri* (Dunker). Near Siassi. Sulu, Philippines; 19.5 mm.

Fig. 6. *N. (N.) gruneri* (Dunker). Type-figure of *Nassa jonkeri* K.Martin (from K.Martin, 1883, pl.7,fig.126).

Fig. 7. *N. (N.) cinctellus* (Gould). Holotype USNM-5723; 8.3 mm.

Fig. 8. *N. (N.) cinctellus* (Gould). Lectotype of *Nassa geniculata* A.Adams, BM(NH) No. 197339; 9.6 mm.

Fig. 9. *N. (N.) cinctellus* (Gould). Lectotype of *Nassa parva* Marrat, Merseyside County Museum, Liverpool; 5.3 mm.

Fig. 10. *N. (N.) cinctellus* (Gould). Nananu-i-Ra I, Fiji Is; 8.7 mm.

Fig. 11. *N. (N.) nodulosus* (Marrat). Lectotype Merseyside County Museum, Liverpool; 15.4 mm.

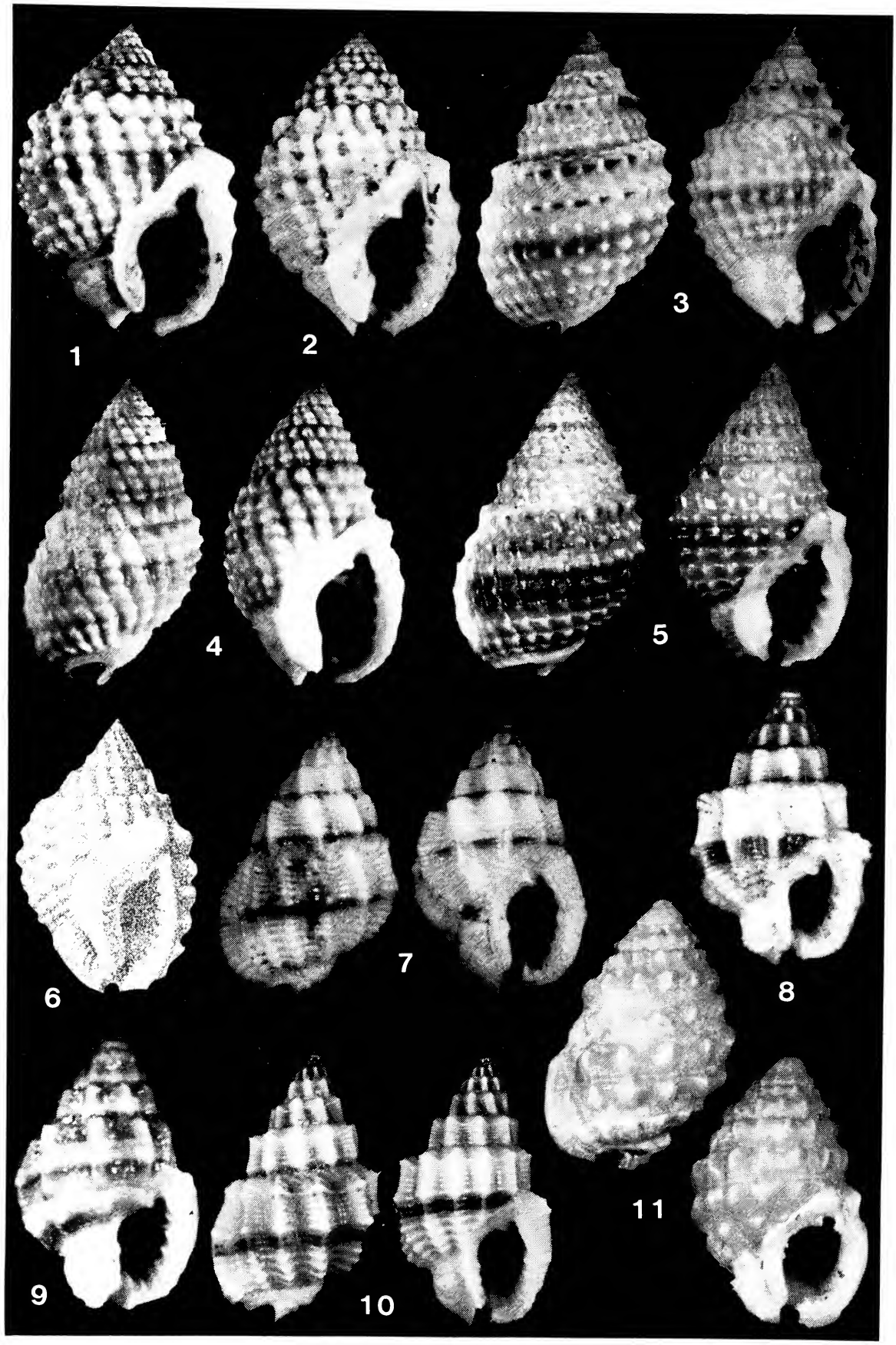
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PLATE 19

Fig. 1. *Nassarius (Niotha) nodulosus* (Marrat). Paralectotype Merseyside County Museum, Liverpool; 14.5 mm.

Fig. 2. *N. (N.) nodulosus* (Marrat). Lectotype of *Nassa polychroma* Melvill, BM(NH); 16.0 mm.

Fig. 3. *N. (N.) nodulosus* (Marrat). Masirah I, Gulf of Oman; 17.0 mm.

Fig. 4. *N. (N.) speciosus* (A.Adams). Lectotype BM(NH) No. 1973129; 29.8 mm.

Fig. 5. *N. (N.) speciosus* (A.Adams). Syntype of *Buccinum plicosum* Dunker, ZMHU; 25.5 mm.

Figs.6,7. *N. (N.) pyramidalis* (A.Adams). Holotype BM(NH) No. 1973160; 21.3 mm.

Fig. 8. *N. (N.) pyramidalis* (A.Adams). Holotype of *Nassa filmerae* Sowerby, BM (NH) No.1900.5.22.41.; 15.5 mm.

Fig. 9. *N. (N.) fidus* (Reeve). Lectotype BM(NH) No. 197113; 14.1 mm.

Fig. 10. *N. (Telasco) gaudiosus* (Hinds). Lectotype BM(NH) No.1844.9.23.17; 17.3 mm.

Fig. 11. *N. (T.) gaudiosus* (Hinds). Lectotype of *Nassa mucronata* A.Adams, BM(NH) No. 1973135; 21.2 mm.

Fig. 12. *N. (T.) gaudiosus* (Hinds). Holotype of *Nassa lilacina* Gould, USNM-5731; 10.5 mm. Juvenile specimen.

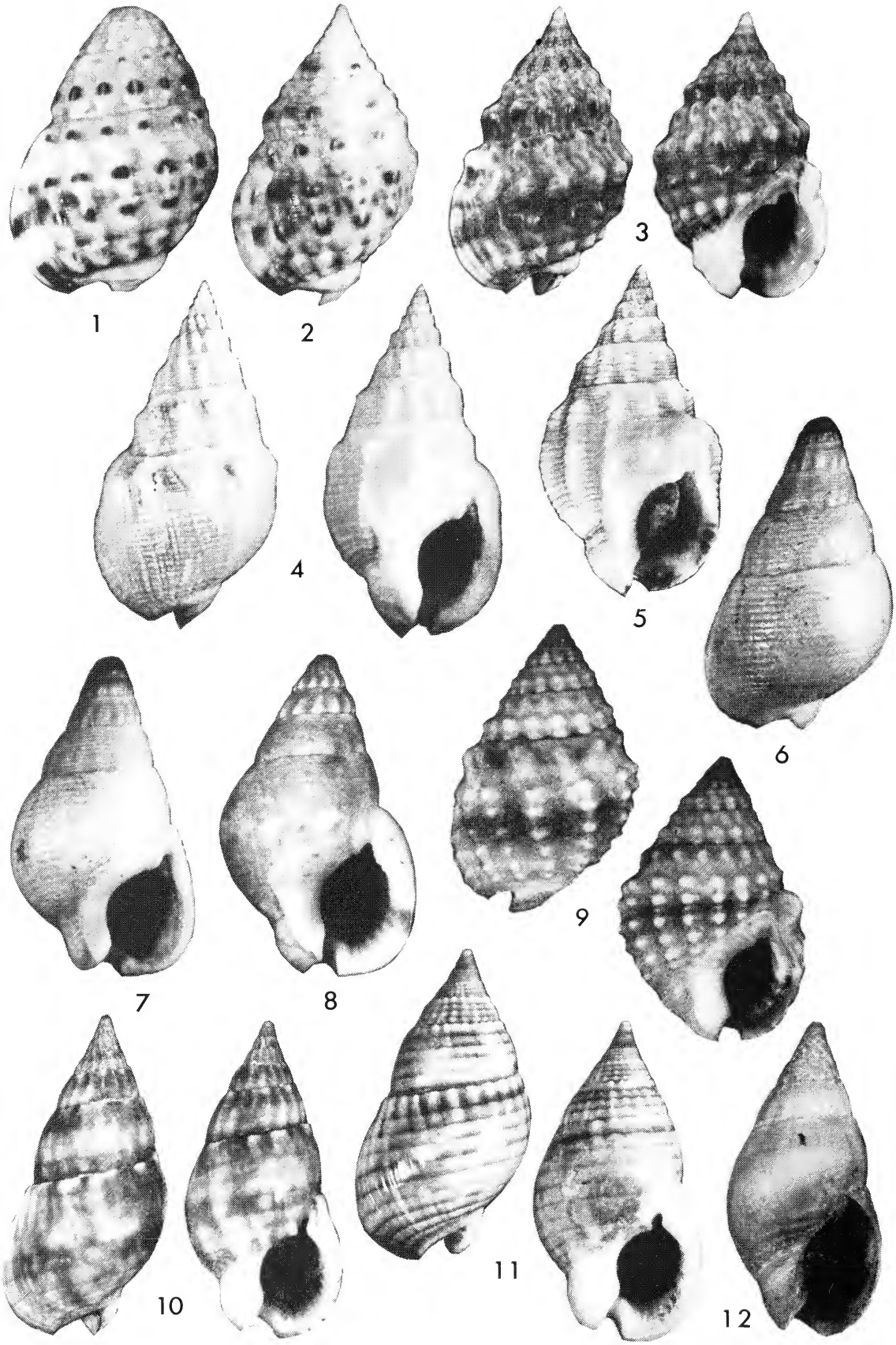
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PLATE 20

Fig. 1. *Nassarius (Telasco) reeveanus* (Dunker). Holotype ZMHU; 16.8 mm.

Fig. 2. *N. (T.) reeveanus* (Dunker). Syntype of *Buccinum velatum* Gould, USNM-18134; 17.3 mm.

Fig. 3. *N. (T.) reeveanus* (Dunker). Lectotype of *Nassa luctuosa* A.Adams, BM(NH) No. 197348; 16.5 mm. Spirally striate form.

Fig. 4. *N. (T.) reeveanus* (Dunker). Lectotype of *Nassa punctata* A.Adams, BM(NH) No.1973136; 22.6 mm.

Fig. 5. *N. (T.) reeveanus* (Dunker). Lectotype of *Nassa lentiginosa* A.Adams, BM(NH) No. 197346; 26.0 mm.

Fig. 6. *N. (T.) reeveanus* (Dunker). Lectotype of *Nassa zonalis* A.Adams, BM(NH) No. 1973145; 16.9 mm.

Fig. 7. *N. (T.) reeveanus* (Dunker). Lectotype of *Nassa filosa* Reeve, BM(NH) No. 1973115; 21.0 mm.

Fig. 8. *N. (T.) reeveanus* (Dunker). Holotype of *Nassa marrati* E.A.Smith, BM(NH) No. 1876.1.10.71; 14.4 mm. Slender form.

Fig. 9. *N. (T.) reeveanus* (Dunker). Holotype of *Nassa mustelina* Gould, USNM-24200; 10.6 mm.

Fig. 10. *N. (T.) reeveanus* (Dunker). Holotype of *Nassa ferruginia* Marrat, Merseyside County Museum, Liverpool. 17.5 mm.

Fig. 11. *N. (T.) exulatus* (E.A.Smith). Holotype BM(NH) No.1911.2.26.12.1; 13.1 mm.

Fig. 12. *N. (T.) limnaeiformis* (Dunker). Probable syntype ex-Dunker coll., ZMHU; 17.7 mm.

Fig. 13. *N. (N.) limnaeiformis* (Dunker). Holotype of *Buccinum coturnix* Dunker, ZMHU; 17.5 mm. Immature specimen.

Fig. 14. *N. (T.) limnaeiformis* (Dunker). Lectotype of *Nassa musiva* Gould, USNM-5720; 15.0 mm.

Fig. 15. *N. (T.) limnaeiformis* (Dunker). Lakeba I, Lau group, Fiji Is; 18.0 mm.

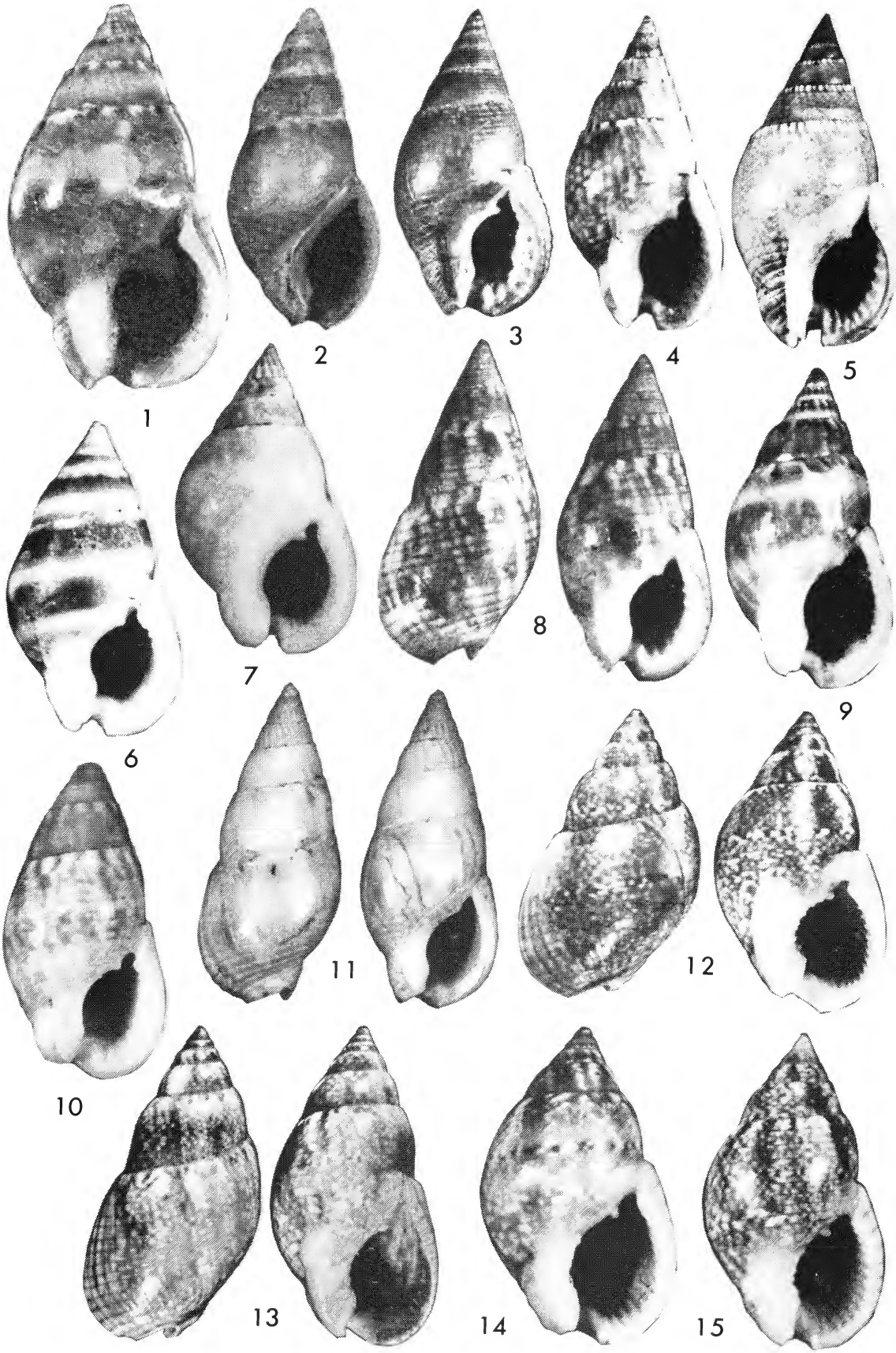
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PLATE 21

Fig. 1. *Nassarius (Telasco) marmoreus* (A.Adams). Lectotype BM(NH) No. 1973138; 27.7 mm.

Fig. 2. *N. (T.) marmoreus* (A.Adams). Mina Al Fahal, Gulf of Oman; 19.6 mm.

Fig. 3. *N. (T.) sufflatus* Gould). Probable syntype of *Buccinum pictum* Dunker, ZMHU; 18.0 mm.

Fig. 4. *N. (T.) sufflatus* (Gould). Neotype USNM-343059; 21.7 mm.

Fig. 5. *N. (T.) sufflatus* (Gould). Holotype of *N.subbalteatus* MacNeil, USNM-562830; 16.2 mm.

Fig. 6. *N. (T.) sufflatus* (Gould). Barrow I, W. Australia; 21.5 mm.

Fig. 7. *N. (T.) luridus* (Gould). Holotype USNM-5721; 19.0 mm.

Fig. 8. *N. (T.) luridus* (Gould). Lectotype of *Nassa dispar* A.Adams, BM(NH) 24.4 mm.

Fig. 9. *N. (T.) luridus* (Gould). Marau Sound, Guadalcanal, Solomon Is; 20.3 mm.

Fig. 10. *N. (T.) albomaculatus* Rehder. Paratype USNM-767046; 16.4 mm.

Fig. 11. *N. (T.) albomaculatus* Rehder. Rapa, Austral Is; 12.0 mm. Immature specimen.

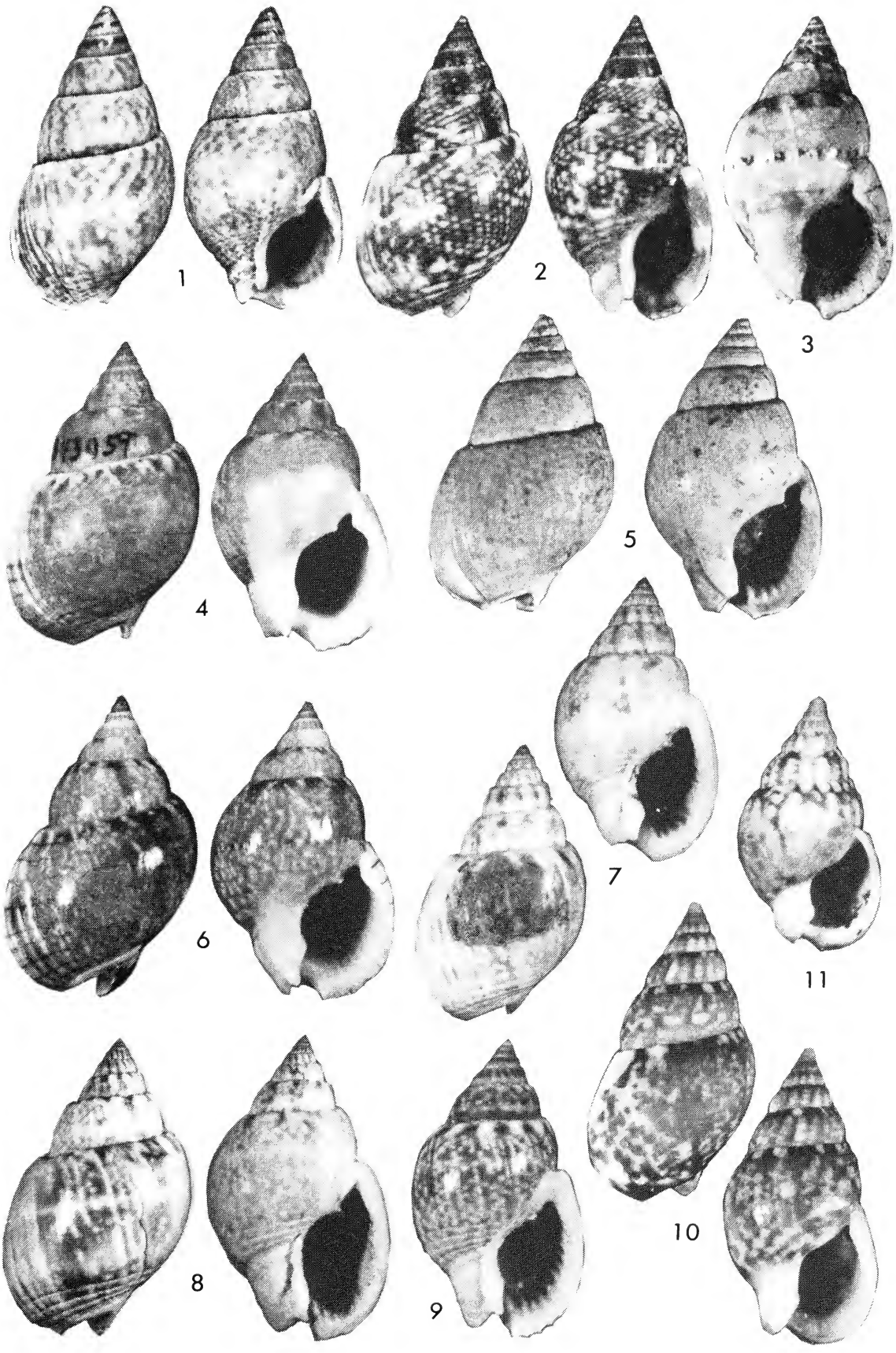
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PLATE 22

Fig. 1. *Nassarius (Telasco) multipunctatus* (Schepman). Lectotype ZMA; 15.4 mm.

Fig. 2. *N. (T.) multipunctatus* (Schepman). Laing I, Papua New Guinea, 60 m; 15.6 mm.

Figs.3,4. *N. (T.) vidalensis* (Barnard). Holotype Natal Museum No. A-8839; 6.3 mm.

Fig. 5. *N. (T.) vidalensis* (Barnard). Enshu-Nada, Honshu, Japan; 6.6 mm.

Fig. 6. *N. (T.) shacklefordi* (Melvill & Standen). Holotype Manchester University Museum; 10.0 mm.

Fig. 7. *N. (T.) shacklefordi* (Melvill & Standen). Off Lord Howe I, 44 m, AMS No. C-114472; 14.0 mm.

Fig. 8. *N. (T.) shacklefordi* Melvill & Standen). False Entrance, Noumea, New Caledonia; 8.5 mm.

Figs.9,10. *N. (T.) javanus* (Schepman). Beira, Mozambique, E.Africa; 17.5 mm.

Fig. 11. *N. (T.) javanus* (Schepman). Holotype Rijksmuseum van Naturlijke Historie, Leiden, No.62a; 22.7 mm.

Fig. 12. *N. (T.) javanus* (Schepman). Syntype of *Nassa fulgurans* Schepman, ZMA; 19.5 mm.

Fig. 13. *N. (T.) javanus* (Schepman). Batu Ferringhi, Penang, Malaysia; 15.8 mm.

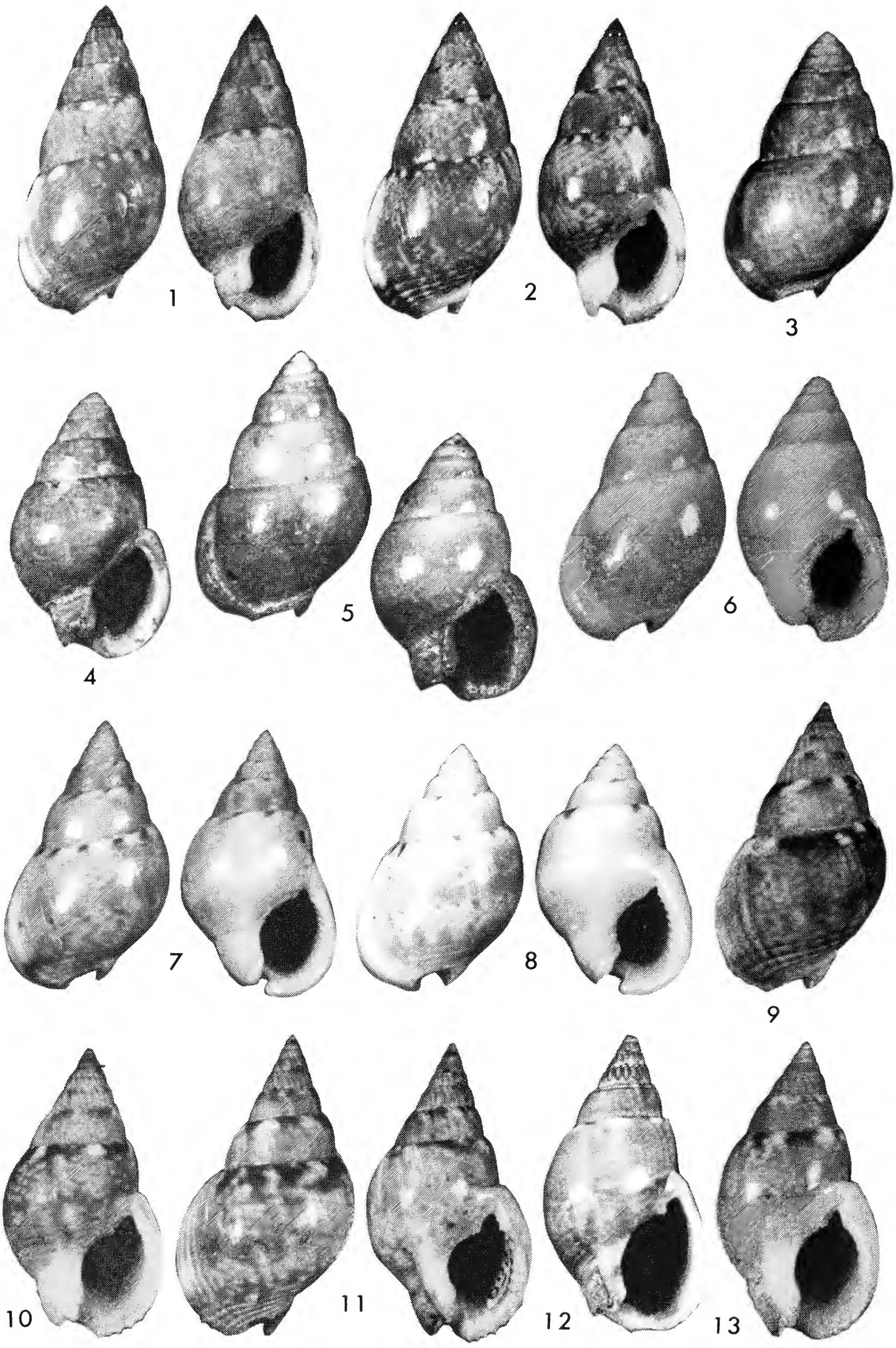
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PLATE 23

Fig. 1. *Nassarius (Telasco) helleri* (Mari). Holotype Inst.Roy.Sci.Nat.Belg., Brussels; 18.5 mm.

Fig. 2. *N. (T.) helleri* (Mari). Holotype of *Nassa soror* Mari, Inst.Roy.Sci.Nat.Belg., Brussels; 16.9 mm.

Fig. 3. *N. (T.) vinctus* (Marrat). Lectotype Merseyside County Museum, Liverpool; 16.9 mm.

Fig. 4. *N. (T.) vinctus* (Marrat). Syntype of *Nassa trifasciata* A.Adams, BM(NH) No. 1973158; 18.3 mm.

Fig. 5. *N. (T.) vinctus* (Marrat). Syntype of *Nassa analogica* Sowerby, BM(NH) No. 1903.7.27.77; 18.8 mm.

Fig. 6. *N. (T.) vinctus* (Marrat). Juvenile holotype of *Nassa aenigmatica* Turton; 7.0 mm (from Turton, 1932, pl.13,fig.431).

Fig. 7. *N. (T.) vinctus* (Marrat). Cape Agulhas, Sth.Africa; 14.7 mm. Axially ribbed form.

Fig. 8. *N. (T.) vinctus* (Marrat). False Bay, Sth. Africa, 55 m; 15.1 mm. Smooth form.

Fig. 9. *N. (Zeuxis) olivaceus* (Bruguière). Juvenile holotype of *Nassa badia* A.Adams, BM(NH) No. 197315; 21.6 mm.

Fig. 10. *N. (Z.) olivaceus* (Bruguière). Lectotype of *Nassa mitralis* A.Adams, BM(NH) No.1973148; 28.0 mm.

Fig. 11. *N. (Z.) olivaceus* (Bruguière). Immature lectotype of *Nassa melanioides* Reeve, BM(NH) No. 197351; 19.8 mm.

Fig. 12. *N. (Z.) olivaceus* (Bruguière). Holotype of *Nassa fusca* Rousseau, MNHNP; 28.0 mm.

Fig. 13. *N. (Z.) olivaceus* (Bruguière). Lectotype of *Nassa approximata* Pease, Museum of Comparative Zoology, Harvard No. 15180; 24.5 mm.

Fig. 14. *N. (Z.) olivaceus* (Bruguière). N. of Kupang, Indonesia; 30.4 mm. Axially ribbed form.

Fig. 15. *N. (Z.) olivaceus* (Bruguière). Phuket, Thailand; 39.8 mm. Intermediate form.

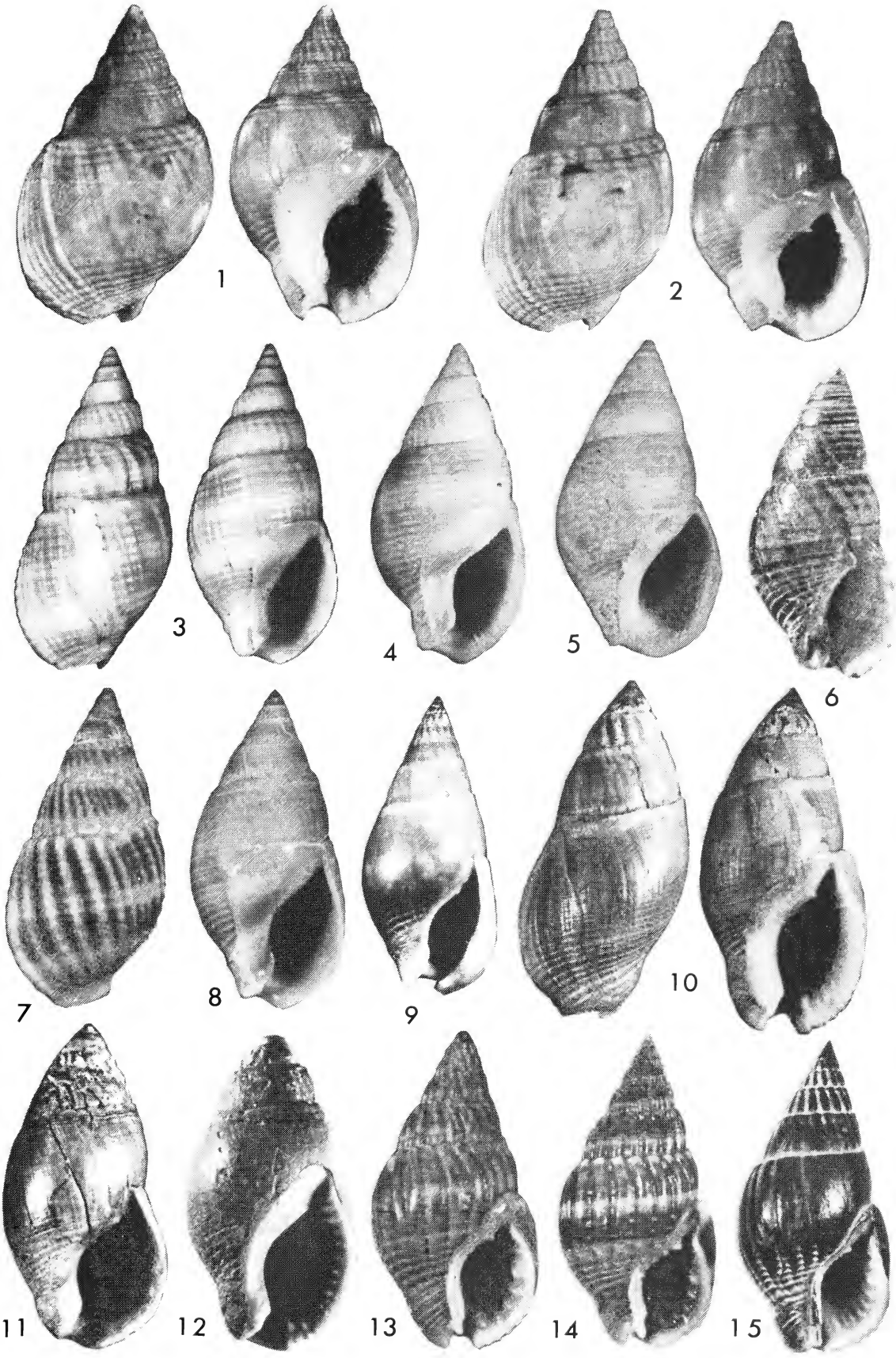
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PLATE 24

Fig. 1. *Nassarius (Zeuxis) crematus* (Hinds). Lectotype BM(NH); 26.7 mm.

Fig. 2. *N. (Z.) crematus* (Hinds). Lectotype of *Nassa ranida* A.Adams, BM(NH) No. 1973123; 18.8 mm.

Fig. 3. *N. (Z.) crematus* (Hinds). Holotype of *Nassa eucomista* Melvill & Standen, BM(NH) No. 1897.6.30.2; 17.2 mm. Slender form.

Fig. 4. *N. (Z.) crematus* (Hinds). Holotype of *Nassa euglypta* Sowerby, BM(NH) No. 1914.4.2.6; 29.4 mm.

Fig. 5. *N. (Z.) crematus* (Hinds). Immature lectotype of *Nassa pulcherrima* Marrat, Merseyside County Museum, Liverpool; 13.9 mm. Slender form.

Fig. 6. *N. (Z.) crematus* (Hinds). Holotype of *Nassa martensi* Thiele, ZMHU; 15.5 mm.

Fig. 7. *N. (Z.) castus* (Gould). Holotype USNM-5724; 10.4 mm. Few-ribbed form.

Figs.8,9. *N. (Z.) castus* (Gould). Lectotype of *Nassa costata* A.Adams, BM(NH) No. 197327; 14.7 mm.

Fig. 10. *N. (Z.) castus* (Gould). Type-figure of *N.minoensis* Itoigawa (from Itoigawa, 1960, pl.6,fig.1).

Fig. 11. *N. (Z.) castus* (Gould). Lectotype of *Nassa oriens* Marrat (and of *N.elongata* Marrat), Merseyside County Museum, Liverpool; 19.0 mm. Slender form.

Fig. 12. *N. (Z.) castus* (Gould). Worn holotype of *Buccinum rufum* Dunker, ZMHU; 20.5 mm.

Fig. 13. *N. (Z.) castus* (Gould). Off Eilat, Gulf of Aqaba, Red Sea; 25.9 mm. Coarsely sculptured Red Sea-Arabian Sea form *rufum*.

Fig. 14. *N. (Z.) castus* (Gould). Lectotype of *Nassa caelata* A.Adams, BM(NH) No. 1973122; 16.4 mm.

Fig. 15. *N. (Z.) castus* (Gould). Lectotype of *Nassa levukensis* Watson, BM(NH) No. 1887.2.9.6.45; 17.8 mm.

Fig. 16. *N. (Z.) castus* (Gould). Juvenile holotype of *Nassa lactea* Marrat, Merseyside County Museum, Liverpool; 16.1 mm.

Fig. 17. *N. (Z.) castus* (Gould). Immature holotype of *Nassa sinensis* Marrat, Merseyside County Museum, Liverpool; 16.4 mm.

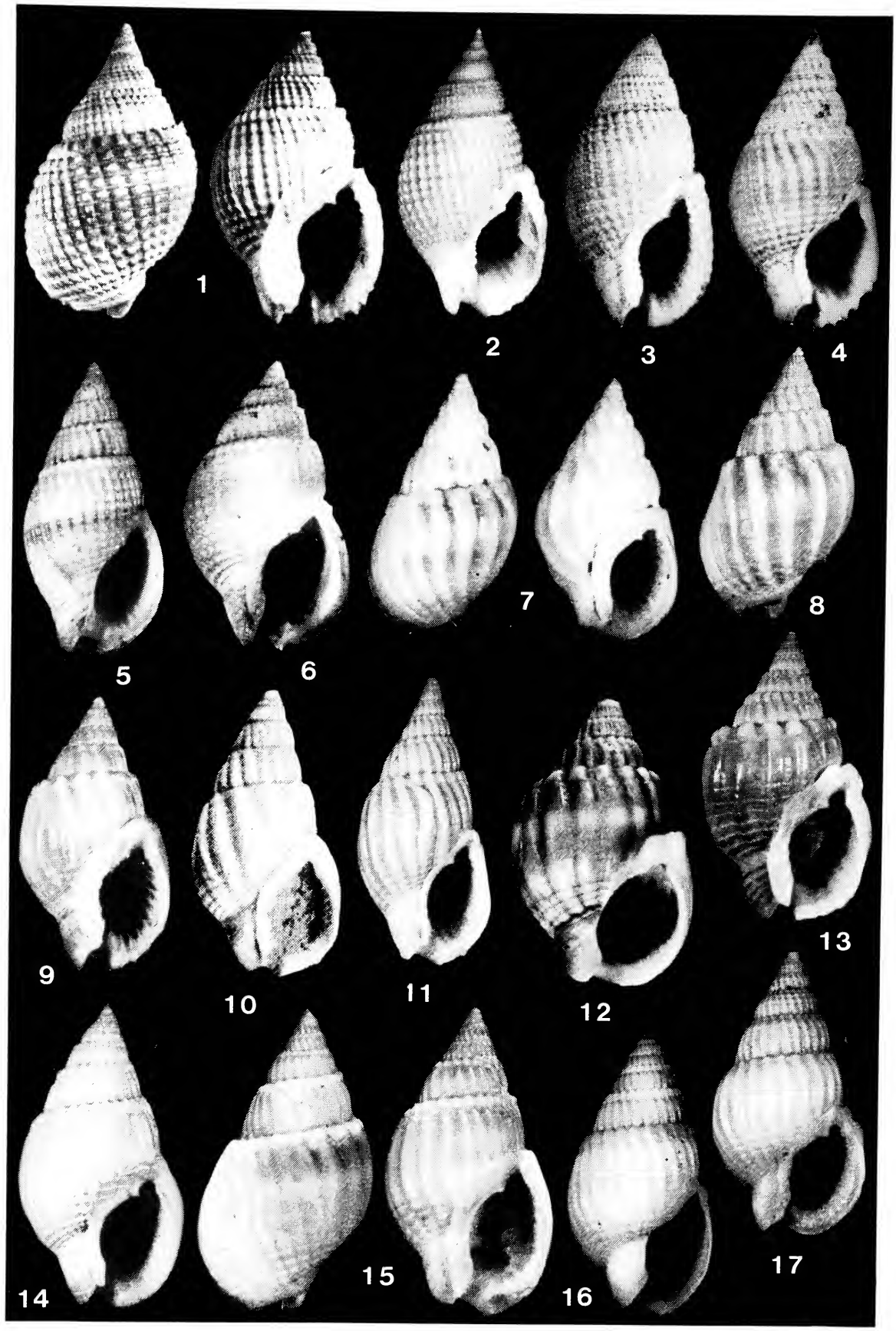
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PLATE 25

Fig. 1. *Nassarius (Zeuxis) castus* (Gould). Juvenile holotype of *N.miyazakiensis* Shuto, GK-L 6161; 11.6 mm.

Fig. 2. *N. (Z.) castus* (Gould). Holotype of *Nassa vitiensis* Rousseau, MNHNP 24.5 mm.

Fig. 3. *N. (Z.) castus* (Gould). Lectotype of *Nassa verbeeki* K.Martin, Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9439; 29.8 mm.

Fig. 4. *N. (Z.) castus* (Gould). Holotype of *Nassa incognita* Thiele, ZMHU; 18.6 mm.

Fig. 5. *N. (Z.) castus* (Gould). Lectotype of *Nassa maldivensis* E.A.Smith, BM(NH) No. 1903.9.17.54; 25.0 mm. Broad, smooth form.

Fig. 6. *N. (Z.) castus* (Gould). Type-figure of *N.kiiensis* Kira; 26.5 mm. Intermediate smooth form.

Fig. 7. *N. (Z.) castus* (Gould). Specimen of forma *kiiensis* from Taiwan; 28.2 mm.

Figs.8,9. *N. (Z.) castus* (Gould). Holotype of *Nassa mulukuensis* E.A.Smith, BM(NH); 24.0 mm. Slender smooth form.

Fig. 10. *N. (Z.) castus* (Gould). Holotype of *Nassa thaumasia* Sturany, Natural History Museum, Vienna, 27.2 mm.

Fig. 11. *N. (Z.) eusulcatus* (Sowerby). Holotype BM(NH) No. 1902.5.28.64; 19.3 mm.

Fig. 12. *N. (Z.) siquijorensis* (A.Adams). Lectotype BM(NH) No. 1973118; 24.0 mm.

Fig. 13. *N. (Z.) siquijorensis* (A.Adams). Holotype of *Nassa crenellifera* A.Adams, BM(NH) No. 197329; 19.3 mm.

Fig. 14. *N. (Z.) siquijorensis* (A.Adams). Holotype of *Nassa cingenda* Marrat, Merseyside County Museum, Liverpool; 30.0 mm.

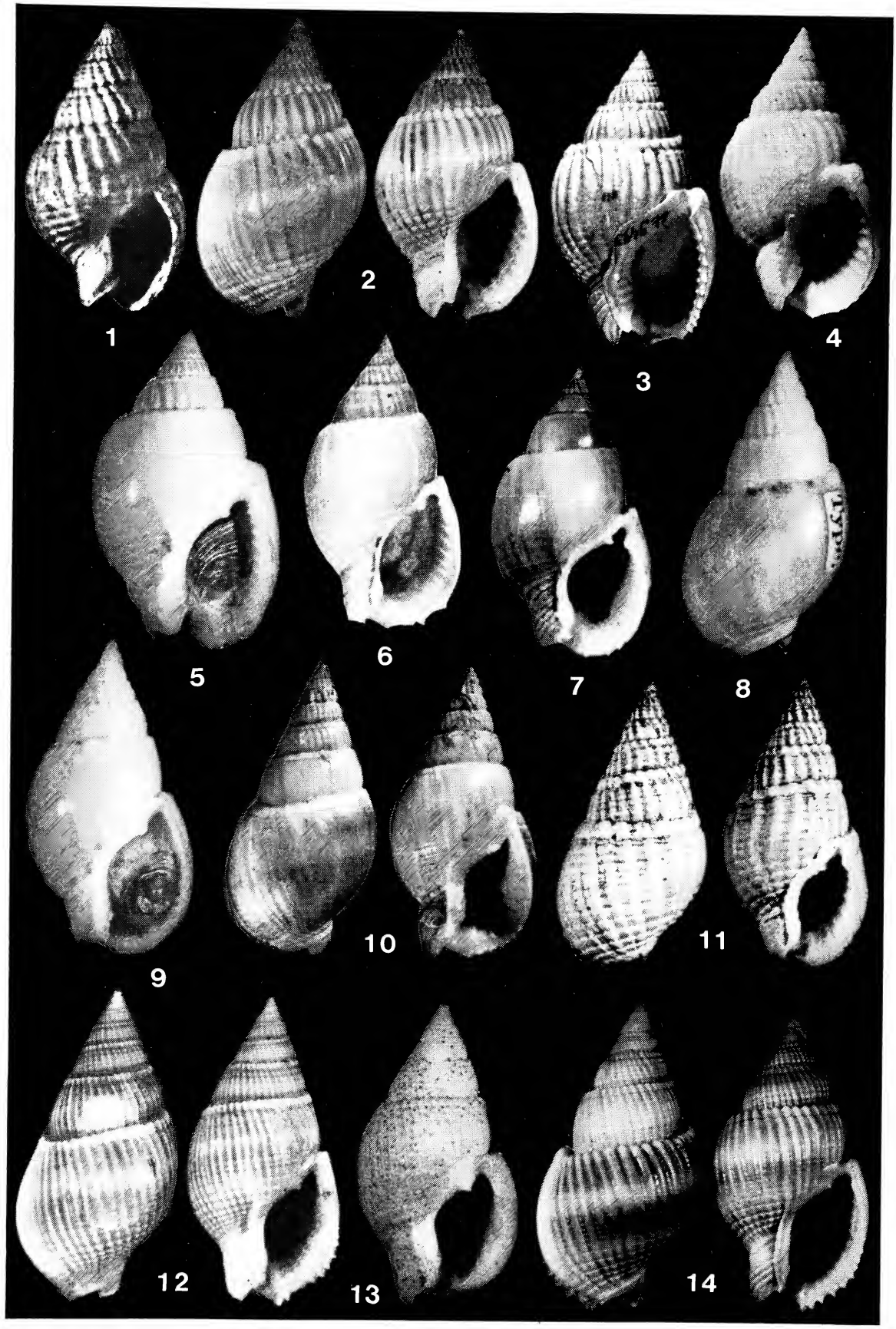
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PLATE 26

Figs.1,2. *Nassarius (Zeuxis) siquijorensis* (A.Adams). 1. Holotype of *N.hirasei* Kuroda & Habe, NSMT No. 48261; 25.5 mm. 2. Paratype of *N.hirasei* NSMT No. 48261; 25.9 mm.

Fig. 3. *N. (Z.) siquijorensis* (A.Adams). Punta Engano, Mactan I, Philippines; 35.0 mm.

Figs.4,5. N. (Z.) siquijorensis (A.Adams). Lampong Bay, Indonesia, 29 m; 37.2 mm. Smooth form *canaliculata* Lamarck.

Fig. 6. *N. (Z.) "scalaris"* (A.Adams). Lectotype BM(NH) No. 1973152; 26.2 mm.

Fig. 7. *N. (Z.) "scalaris"* (A.Adams). Efate I, Vanuatu; 25.7 mm.

Fig. 8. *N. (Z.) bicallosus* (E.A.Smith). Lectotype BM(NH) No. 1876.1.10.29; 21.3 mm.

Fig. 9. *N. (Z.) bicallosus* (E.A.Smith). Lectotype of *Nassa glabella* Marrat, Merseyside County Museum, Liverpool; 24.6 mm.

Figs.10,11. *N. (Z.) bicallosus* (E.A.Smith). Holotype of *Nassa laevigata* Marrat, Merseyside County Museum, Liverpool; 20.4 mm.

Fig. 12. *N. (Z.) algidus* (Reeve). Lectotype BM(NH) No. 197314; 23.2 mm.

Fig. 13. *N. (Z.) algidus* (Reeve). Urangan, Qld., Australia; 22.6 mm (dorsal view) and 21.3 mm (ventral view).

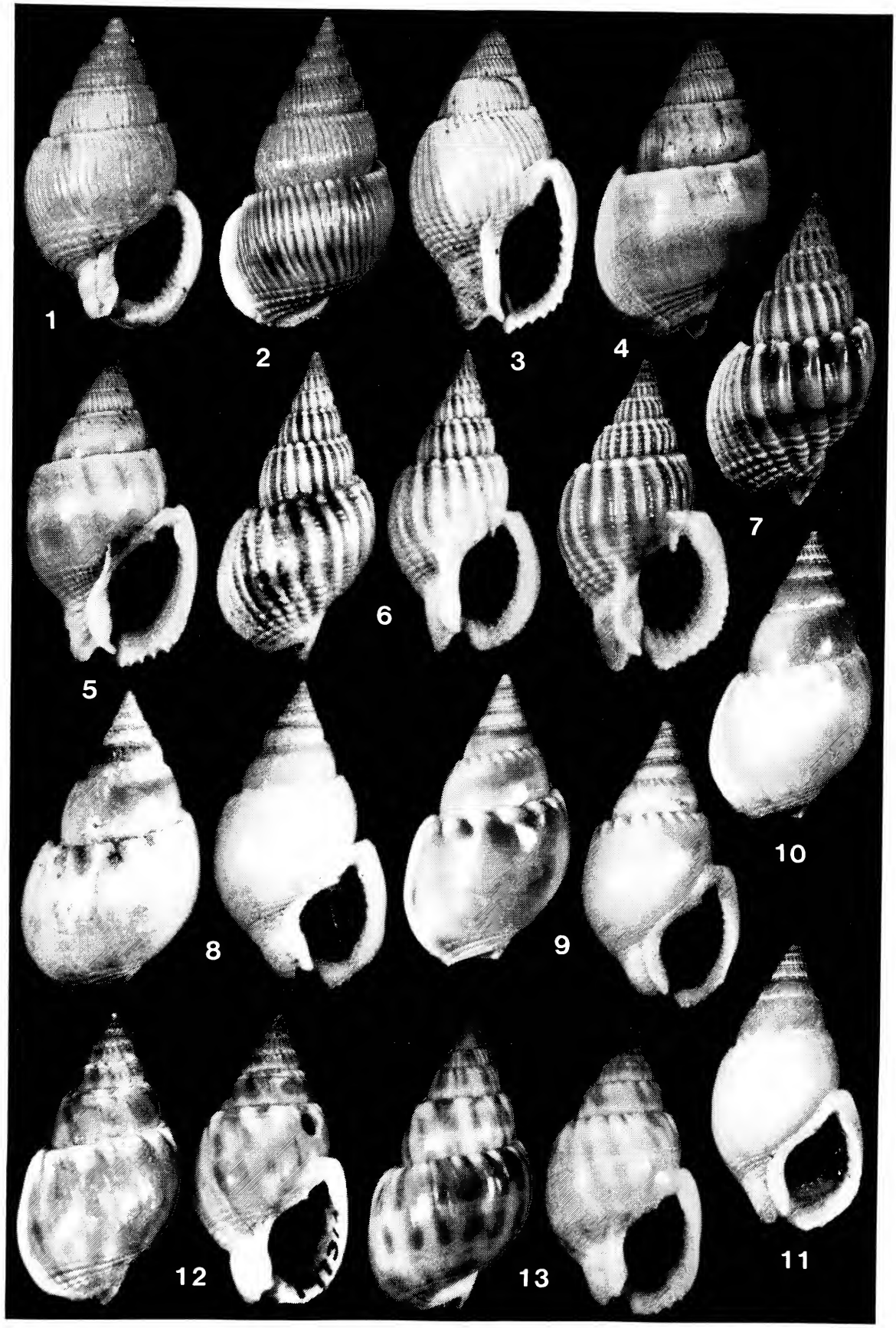
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PLATE 27

Fig. 1. *Nassarius (Zeuxis) barsdelli* (Ladd). Holotype USNM-214274; 23.8 mm. Juvenile specimen.

Fig. 2. *N. (Z.) barsdelli* (Ladd). Mature specimen from Kere River, Pleistocene of Vanuatu.

Fig. 3. *N. (Z.) barsdelli* (Ladd). Off Manila Bay, Philippines, 134 m; 26.0 mm.

Fig. 4. *N. (Z.) acuminatus* (Marrat). Holotype Merseyside County Museum, Liverpool; 29.7 mm.

Fig. 5. *N. (Z.) acuminatus* (Marrat). Macassar Strait, Indonesia, 49 m; 20.5 mm. Axially ribbed specimen.

Fig. 6. *N. (Z.) acuminatus* (Marrat). Lectotype of *Nassa elegantula* Schepman, ZMA; 24.3 mm.

Fig. 7. *N. (Z.) margaritifer* (Dunker). Probable syntype ex-Dunker coll., ZMHU; 19.9 mm.

Fig. 8. *N. (Z.) margaritifer* (Dunker). Lectotype of *Nassa costellifera* A.Adams, BM(NH) No. 1973167; 26.0 mm.

Fig. 9. *N. (Z.) multicostatus* (A.Adams). Lectotype BM(NH) No.1973171; 13.0 mm.

Fig. 10. *N. (Z.) multicostatus* (A.Adams). Holotype of *Nassa multiplicata* Schepman, Rijksmuseum van Geologie en Mineralogie, Leiden; 15.1 mm.

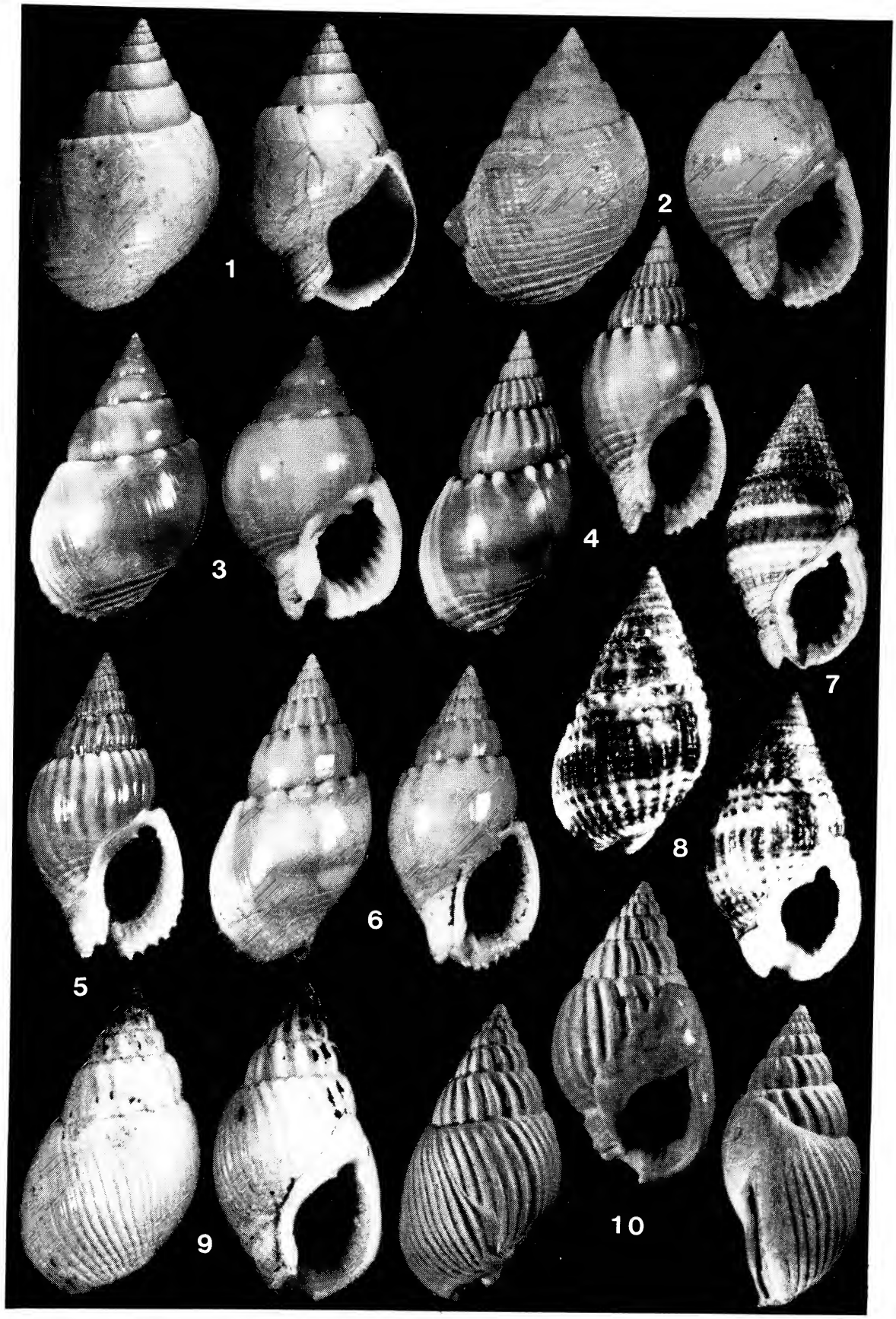
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PLATE 28

Fig. 1. *Nassarius (Zeuxis) multicostatus* (A.Adams). Rabaul, Papua New Guinea; 14.8 mm.

Fig. 2. *N. (Z.) concinnus* (Powys). Lectotype BM(NH) No.197362; 18.8 mm. Slender, multicostate form.

Fig. 3. *N. (Z.) concinnus* (Powys). Lectotype of *Nassa voluptabilis* Jousseaume, MNHNP; 12.0 mm.

Fig. 4. *N. (Z.) concinnus* (Powys). Lectotype of *Nassa smithii* Marrat, Merseyside County Museum, Liverpool; 12.6 mm.

Fig. 5. *N. (Z.) concinnus* (Powys). Lectotype of *Nassa concentrica* Marrat, Merseyside County Museum, Liverpool; 9.6 mm. Broad form.

Fig. 6. *N. (Z.) concinnus* (Powys). Lectotype of *Nassa rotundicostata* Marrat, Merseyside County Museum, Liverpool; 12.0 mm.

Fig. 7. *N. (Z.) concinnus* (Powys). Lectotype of *Nassa cribraria* Marrat, Merseyside County Museum, Liverpool; 9.6 mm. Broad specimen with fewer axial ribs.

Fig. 8. *N. (Z.) concinnus* (Powys). Type-figure of *N.pseudomundus* Oostingh; 18.0 mm (from Oostingh, 1935, pl.6).

Fig. 9. *N. (Z.) concinnus* (Powys). Worn holotype of *Nassa interlirata* E.A.Smith, BM(NH) No. 1876.1.10.28; 6.4 mm. Dwarf specimen.

Fig. 10. *N. (Z.) haldemanni* (Dunker). Holotype ZMHU; 13.6 mm.

Fig. 11. *N. (Z.) haldemanni* (Dunker). Lectotype of *Nassa sertula* A.Adams, BM(NH) No. 1973146; 16.0 mm.

Fig. 12. *N. (Z.) haldemanni* (Dunker). Holotype of *Nassa isseli* Bisacchi, Museo Civico di Storia Naturale, Genova; 6.5 mm. Small specimen.

Fig. 13. *N. (Z.) haldemanni* (Dunker). Moce I, Lau group, Fiji Is; 11.4 mm.

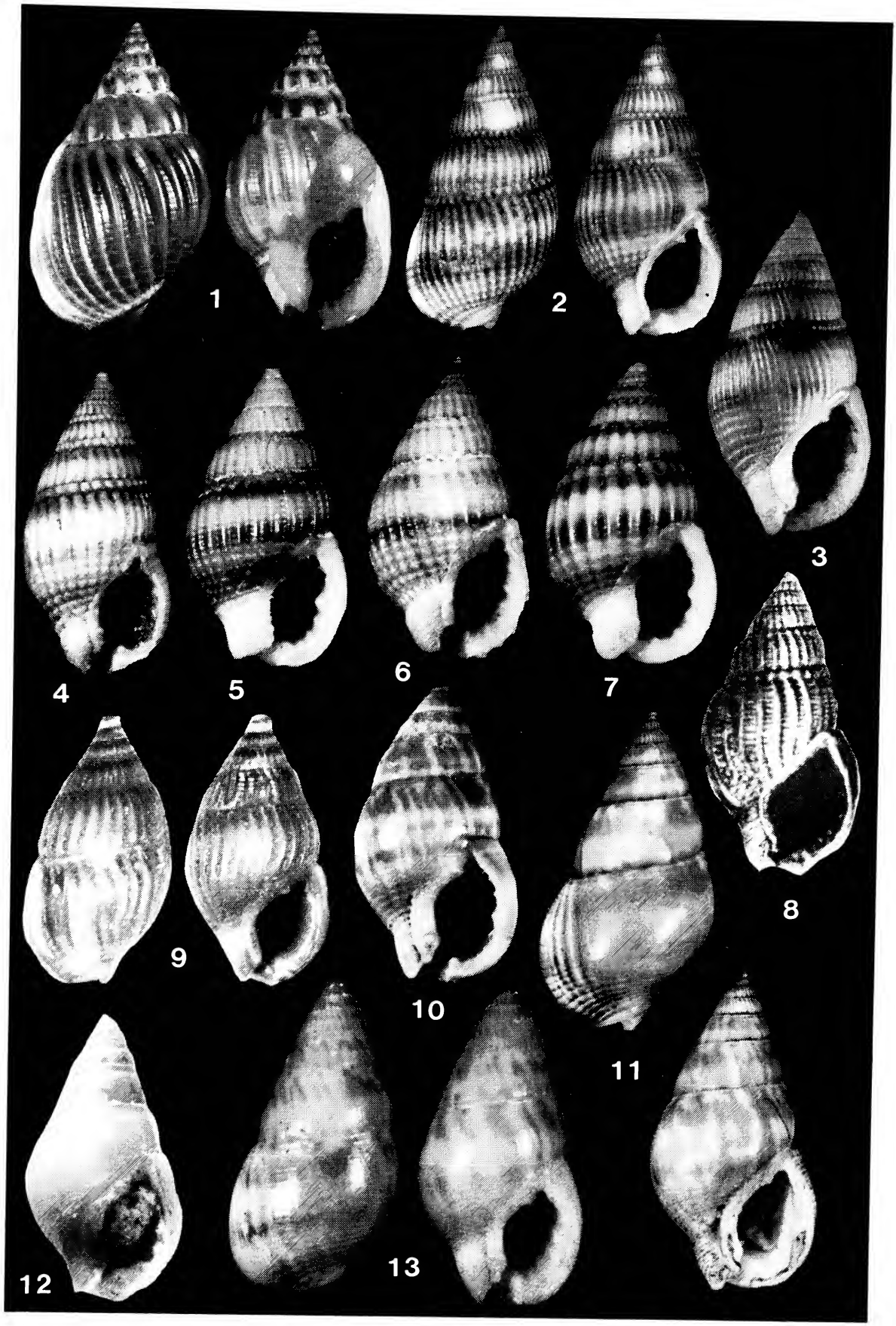
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PLATE 29

Fig. 1. *Nassarius (Zeuxis) comptus* (A.Adams). Lectotype BM(NH); 18.8 mm.

Fig. 2. *N. (Z.) comptus* (A.Adams). Lectotype of *Nassa bucculenta* Marrat, Merseyside County Museum, Liverpool; 14.0 mm.

Fig. 3. *N. (Z.) comptus* (A.Adams). Syntype of *Nassa flammulata* Schepman, Rijksmuseum van Naturlijke Historie, Leiden; 14.4 mm.

Fig. 4. *N. (Z.) comptus* (A.Adams). Type-figure of *N.tateyamensis* Kuroda (from Kuroda, 1929, pl.3,fig.12).

Fig. 5. *N. (Z.) comptus* (A.Adams). Holotype of *Zeuxis excellens* Kuroda & Habe, NSMT No. 48262; 25.0 mm.

Fig. 6. *N. (Z.) comptus* (A.Adams). Holotype of *Nassa cinnamomea* A.Adams, BM(NH) No.197321; 23.8 mm. Slender form.

Fig. 7. *N. (Z.) comptus* (A.Adams). Lectotype of *Nassa polita* Marrat, Merseyside County Museum, Liverpool; 18.4 mm.

Fig. 8. *N. (Z.) micans* (A.Adams). Holotype BM(NH) No. 1973141; 15.6 mm.

Fig. 9. *N. (Z.) micans* (A.Adams). Holotype of *Nassa pallidula* A.Adams, BM(NH) No. 1973143; 17.4 mm. Immature specimen.

Fig. 10. *N. (Z.) micans* (A.Adams). Type-figure of *Nassa unicolor* Rousseau (from Rousseau, 1854, pl.21).

Fig. 11. *N. (Z.) micans* (A.Adams). Lampong Bay, Kei-Oerne, Indonesia; 29 m; 22.3 mm.

Fig. 12. *N. (Z.) foveolatus* (Dunker). Lectotype ZMHU; 17.2 mm.

Fig. 13. *N. (Z.) foveolatus* (Dunker). Lectotype of *Nassa planocostata* A.Adams, BM(NH) No. 1973153; 17.0 mm.

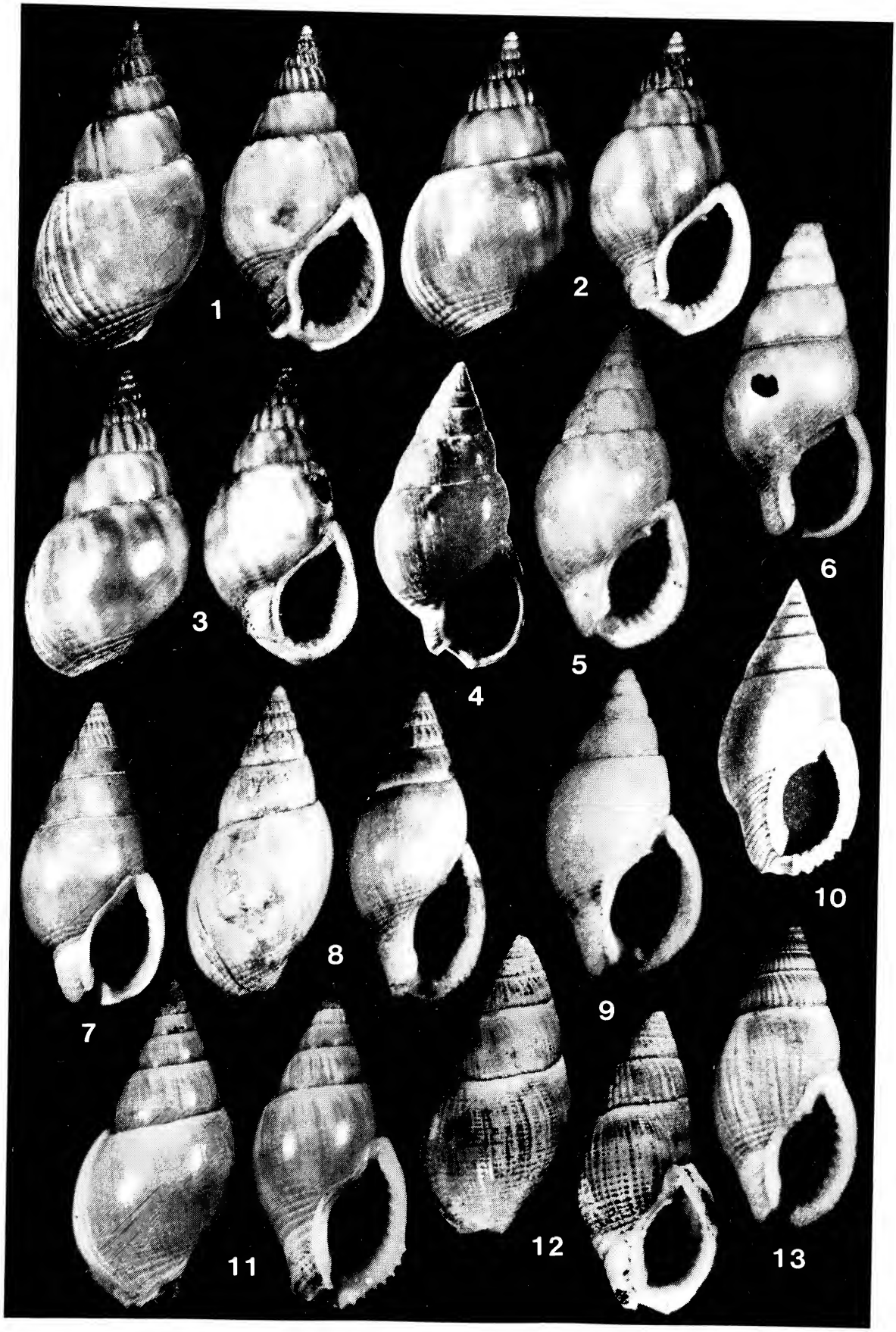
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PLATE 30

Fig. 1. *Nassarius (Zeuxis) foveolatus* (Dunker). Madras, India; 15.8 mm.

Fig. 2. *N. (Z.) protrusidens* (Melvill). Holotype BM(NH) No. 1921.1.28.3; 11.4 mm.

Fig. 3. *N. (Z.) protrusidens* (Melvill). Straits of Formosa, 150 m; 17.8 mm.

Fig. 4. *N. (Z.) protrusidens* (Melvill). Tulear, Madagascar; 10.7 mm.

Fig. 5. *N. (Z.) fraudator* Cernohorsky. Holotype AMS No.C-114468; 10.7 mm.

Fig. 6. *N. (Z.) fraudator* Cernohorsky. Paratype from Hall Sound near Port Moresby, Papua New Guinea; 16.0 mm.

Fig. 7. *N. (Z.) fraudator* Cernohorsky. Strongly ribbed paratype from Darwin, Northern Territory, Australia; 12.9 mm.

Fig. 8. *N. (Z.) subtranslucidus* (E.A.Smith). Holotype BM(NH) No. 1903.9.17.41.; 8.0 mm.

Fig. 9. *N. (Z.) subtranslucidus* (E.A.Smith). Holotype of *Zeuxis hayashii* Habe, NSMT No. 43866; 11.7 mm. Smooth form.

Fig. 10. *N. (Z.) subtranslucidus* (E.A.Smith). Paratype of *Zeuxis hayashii* Habe, NSMT; 12.3 mm. Axially ribbed form.

Fig. 11. *N. (Z.) subtranslucidus* (E.A.Smith). S.W. of Tg Ratoe, Maikoor, Aru Is, Indonesia; 9.3 mm. Smooth form.

Fig. 12. *N. (Z. subtranslucidus* (E.A.Smith). Between Warbal and Ur I, W. of Nuhu Rowa, Kai Is, 59-62 m; 9.0 mm. Axially ribbed form.

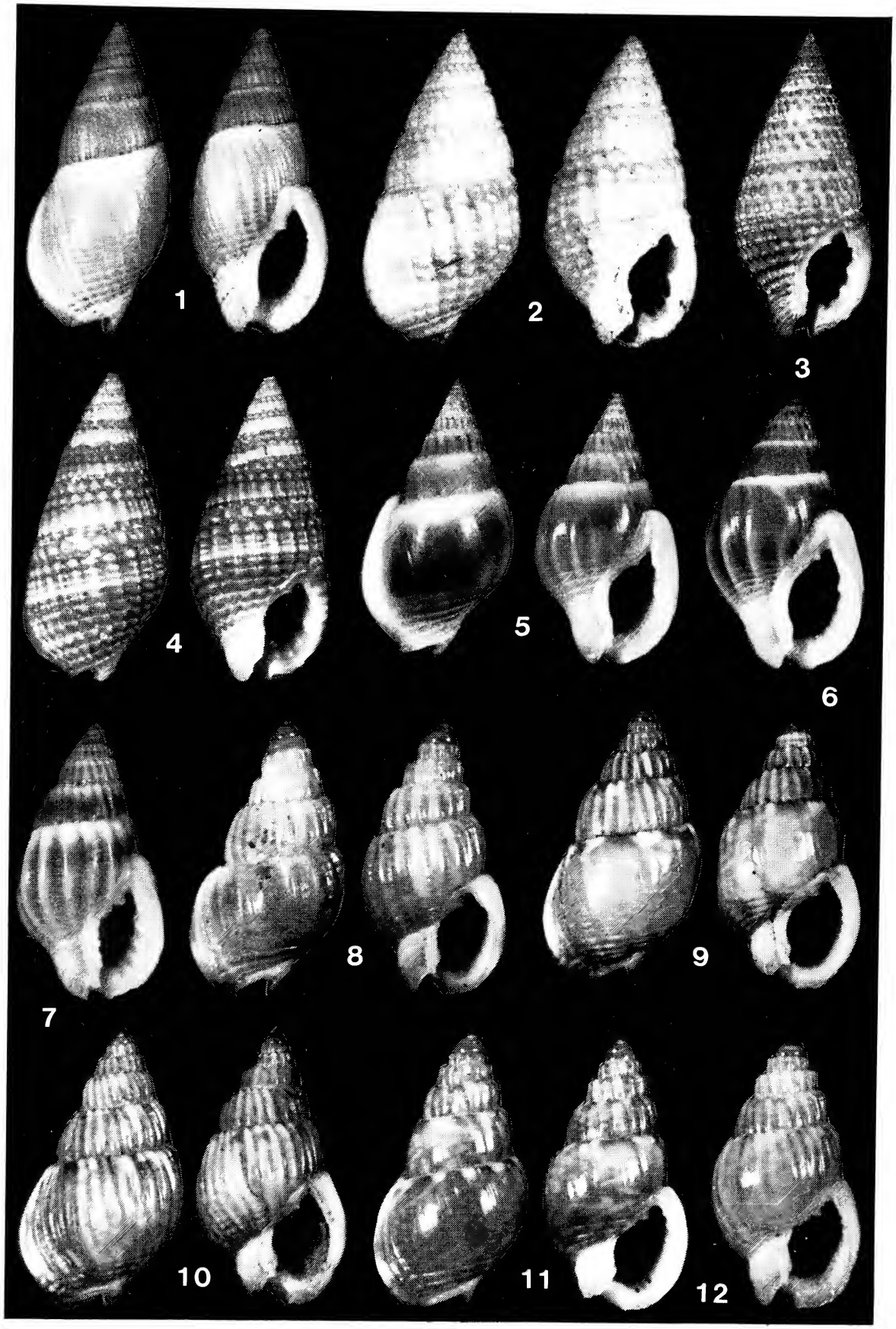
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PLATE 31

Fig. 1. *Nassarius (Zeuxis) pseudoconcinnus* (E.A.Smith). Lectotype BM(NH); 14.6 mm.

Fig. 2. *N. (Z.) pseudoconcinnus* (E.A.Smith). Holotype of *Nassa sturtiana* Melvill & Standen, BM(NH); 18.0 mm.

Fig. 3. *N. (Z.) pseudoconcinnus* (E.A.Smith). Tranquebar, India; 17.8 mm.

Fig. 4. *N. (Z.) mamilliferus* (Melvill). Lectotype BM(NH); 11.3 mm.

Fig. 5. *N. (Z.) roissyi* (Deshayes in Bélanger). Holotype MNHNP; 15.3 mm.

Fig. 6. *N. (Z.) frederici* (Melvill & Standen). Lectotype of *Nassa frederici* Melvill & Standen and *N. townsendi* Melvill, BM(NH) No. 1897.7.30.116; 14.6 mm.

Fig. 7. *N. (Z.) frederici* (Melvill & Standen). Lectotype of *Nassa scalarina* Marrat, Merseyside County Museum, Liverpool; 10.3 mm.

Fig. 8. *N. (Z.) frederici* (Melvill & Standen). Holotype of *Nassa tindalli* Melvill, BM(NH) No. 1906.7.12.1; 12.8 mm.

Fig. 9. *N. (Z.) frederici* (Melvill & Standen). Kaup near Mangalore, India; 12.8 mm. Turreted form.

Fig. 10. *N. (Z.) sinarus* (Philippi). Syntype ex-Dunker coll., ZMHU; 17.0 mm.

Fig. 11. *N. (Z.) sinarus* (Philippi). Amoy, China; 16.7 mm.

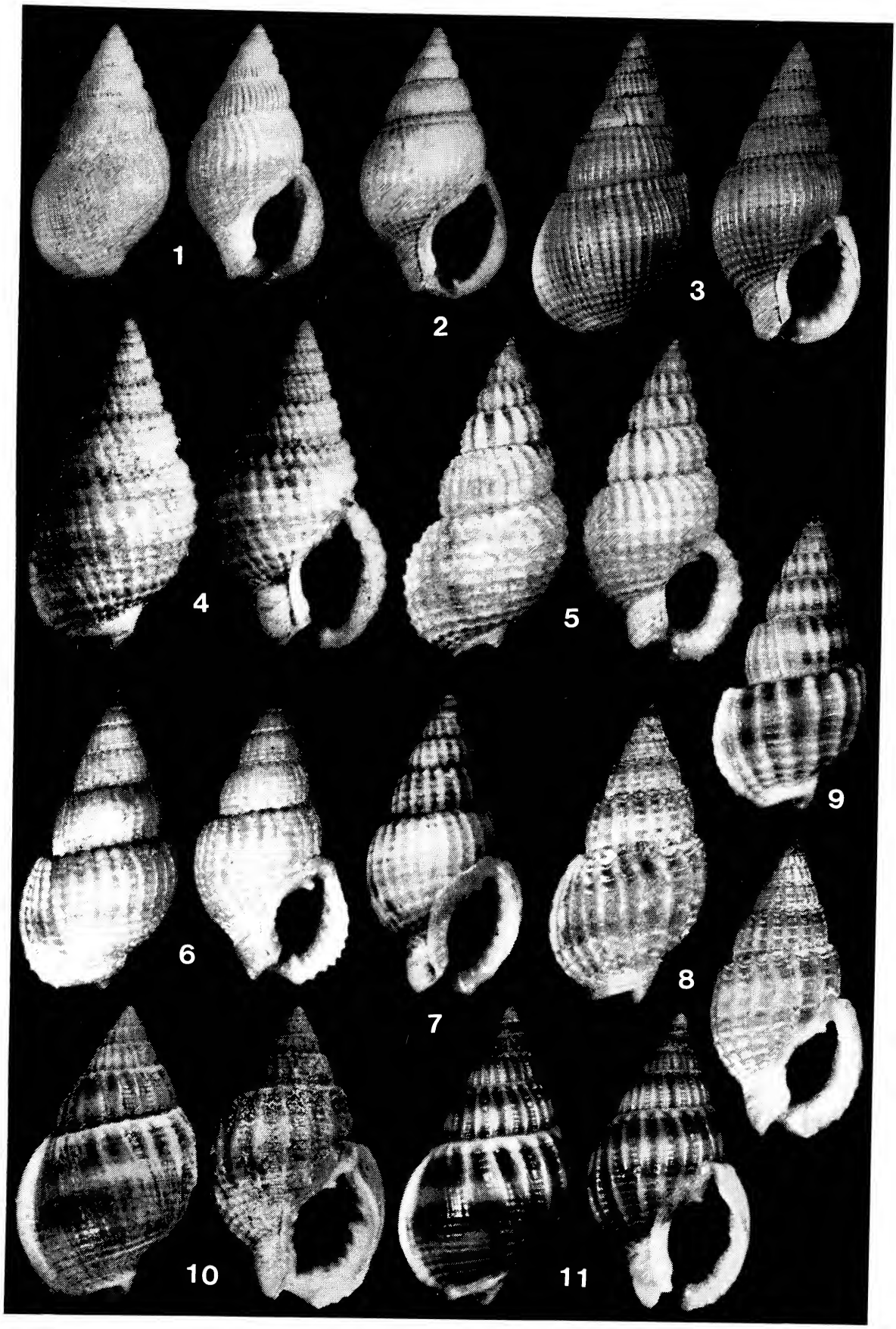
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PLATE 32

Fig. 1. *Nassarius (Zeuxis) sinarus* (Philippi). Lectotype of *Nassa semiplicata* A.Adams, BM(NH) No.1973147; 16.0 mm.

Fig. 2. *N. (Z.) clarus* (Marrat). Worn and faded holotype, Merseyside County Museum, Liverpool; 14.3 mm.

Fig. 3. *N. (Z.) clarus* (Marrat). Lectotype of *Nassa australis* A.Adams, BM(NH) No. 197313; 25.6 mm.

Fig. 4. *N. (Z.) clarus* (Marrat). Specimen on left from Townsville, Qld., Australia; 16.7 mm. Specimen on right from Noorea's reef, Regnard Bay. N.W. Australia; 19.1 mm.

Fig. 5. *N. (Z.) succinctus* (A.Adams). Lectotype BM(NH) No.1973144; 19.6 mm.

Fig. 6. *N. (Z.) succinctus* (A.Adams). Paralectotype BM(NH); 17.6 mm.

Fig. 7. *N. (Z.) succinctus* (A.Adams). Holotype of *Nassa pusilla* Marrat, Merseyside, County Museum, Liverpool; 8.7 mm (Questionable synonymy).

Figs.8,9. *N. (Z.) idyllius* (Melvill & Standen). Lectotype BM(NH) No. 1901.12.9.158; 11.0 mm.

Fig. 10. *N. (Z.) idyllius* (Melvill & Standen). S.E. of Bustani, Persian Gulf; 11.9 mm. Specimen with more numerous axial ribs.

Fig. 11. *N. (Z.) idyllius* (Melvill & Standen). Lectotype of *Nassa ovoidea* Schepman, ZMA; 6.8 mm.

Fig. 12. *N. (Z.) idyllius* (Melvill & Standen). Lectotype of *Nassa torresiana* Hedley, AMS No.C-8072; 5.3 mm.

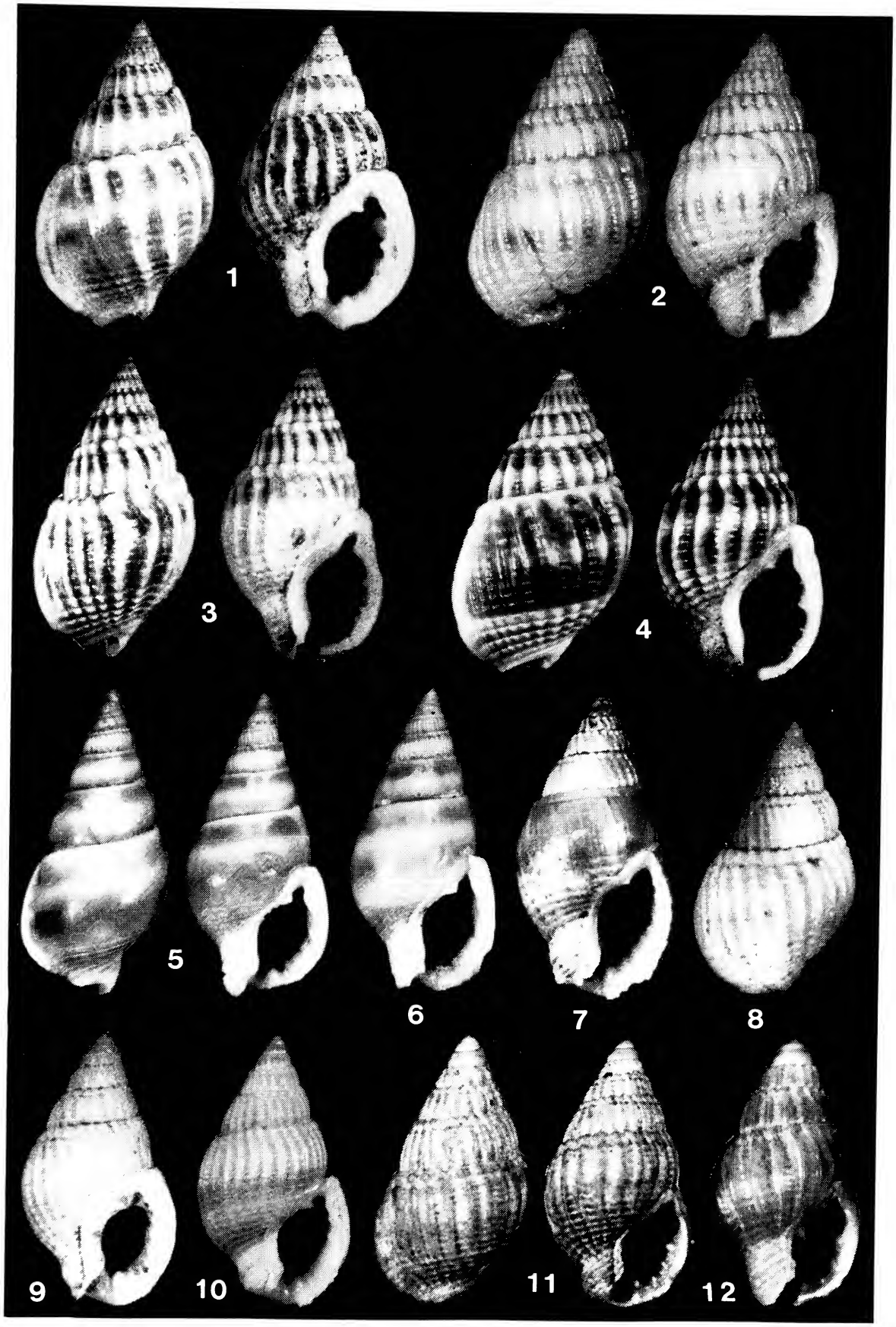
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PLATE 33

Fig. 1. *Nassarius (Zeuxis) macrocephalus* (Schepman). Lectotype ZMA; 4.5 mm.

Fig. 2. *N. (Z.) macrocephalus* (Schepman). Samar, Philippines, 82 m; 4.8 mm.

Fig. 3. *N. (Z.) crebricostatus* (Schepman). Paralectotype, ZMA; 6.7 mm.

Fig. 4. *N. (Z.) crebricostatus* (Schepman). Lectotype ZMA; 6.7 mm.

Fig. 5. *N. (Z.) crebricostatus* (Schepman). Off Laing I, Hansa Bay, Papua New Guinea, 65 m; 6.5 mm.

Fig. 6. *N. (Z.) crebricostatus* (Schepman). Andaman Is; 9.2 mm.

Fig. 7. *N. (Z.) crebricostatus* (Schepman). Off Refugio I, Philippines, 472 m; 9.0 mm.

Fig. 8. *N. (Z.) crebricostatus* (Schepman). Holotype of *N. beccarii* Bisacchi, Museo Civico di Storia Naturale, Genoa; 11.0 mm. Juvenile specimen.

Fig. 9. *N. (Z.) olomea* Kay. Holotype Bernice P. Bishop Museum, Honolulu, No.9802; 14.8 mm.

Figs.10,11. *N. (Z.) olomea* Kay. Off Keehi lagoon, Oahu, Hawaiian Is, 183 m; 13.3 mm.

Fig. 12. *N. (Z.) tabescens* (Marrat). Holotype Merseyside County Museum, Liverpool; 7.0 mm.

Fig. 13. *N. (Z.) tabescens* (Marrat). Mataiea, Tahiti, Society Is; 5.6 mm.

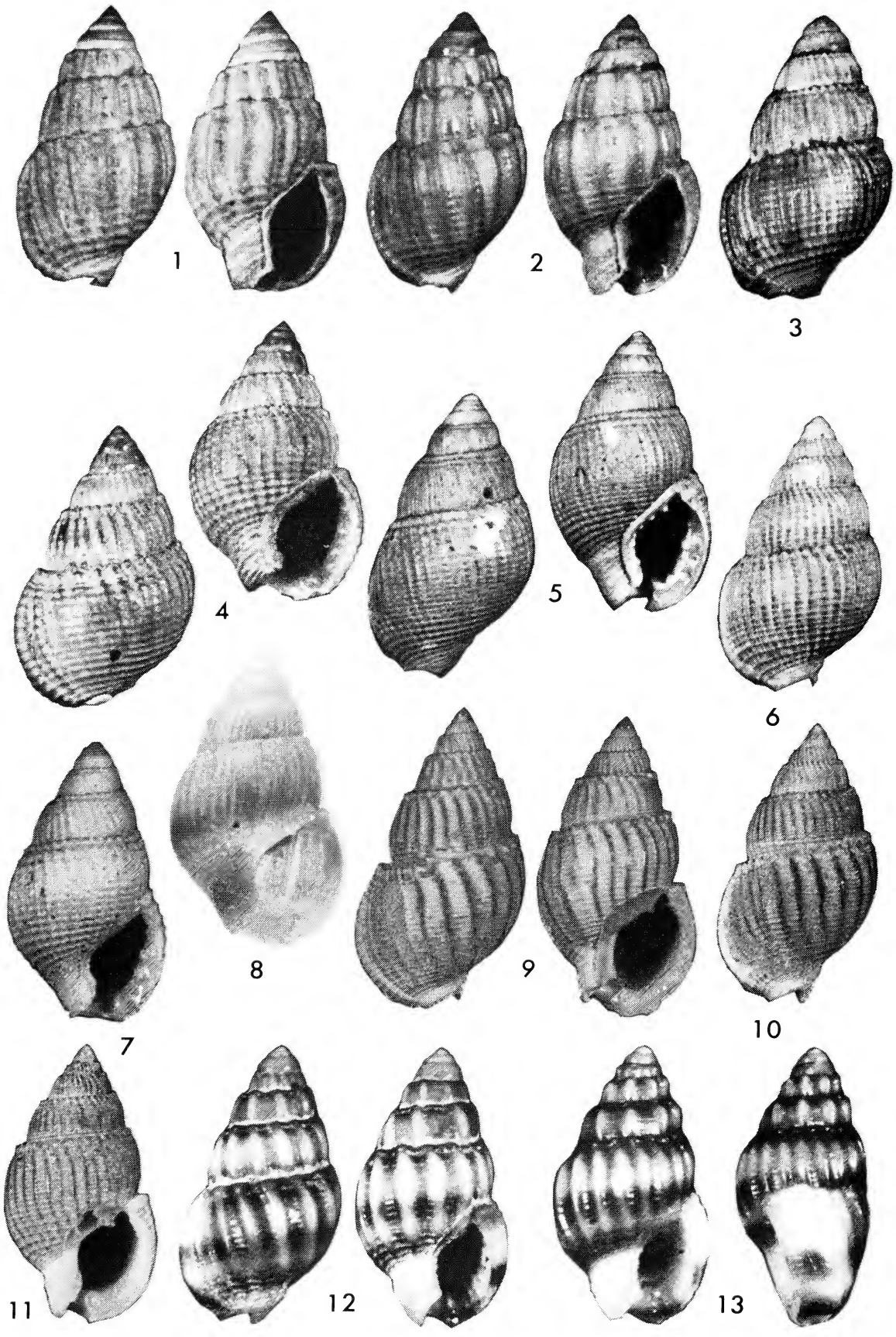
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PLATE 34

Fig. 1. *Nassarius (Zeuxis) disparilis* (E.A.Smith). Holotype BM(NH) No. 1903.9.17.28; 7.4 mm.

Fig. 2. *N. (Z.) disparilis* (E.A.Smith). Holotype of *Nassa jucunda* Preston, ZSI No. 4012/1; 5.0 mm.

Figs.3,4. *N. (Z.) celebensis* (Schepman). Holotype Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-102.440; 6.8 mm.

Fig. 5. *N. (Z.) celebensis* (Schepman). Lectotype of *Nassa minutula* Thiele, ZMHU; 6.3 mm.

Fig. 6. *N. (Z.) celebensis* (Schepman). Holotype of *N. marshallensis* Ladd, USNM-175063; 7.9 mm.

Fig. 7. *N. (Z.) celebensis* (Schepman). Punta Engano, Mactan I, Cebu, Philippines; 8.5 mm.

Fig. 8. *N. (Z.) plicatellus* (A.Adams). Lectotype BM(NH) No. 1973157; 24.4 mm.

Fig. 9. *N. (Z.) plicatellus* (A.Adams). Lectotype of *Nassa nivea* A.Adams, BM(NH) No. 1973156; 23.3 mm.

Fig. 10. *N. (Z.) plicatellus* (A.Adams). Worn juvenile holotype of *Nassa scopularca* Barnard, South African Museum, Cape Town, No. A-9230; 14.4 mm.

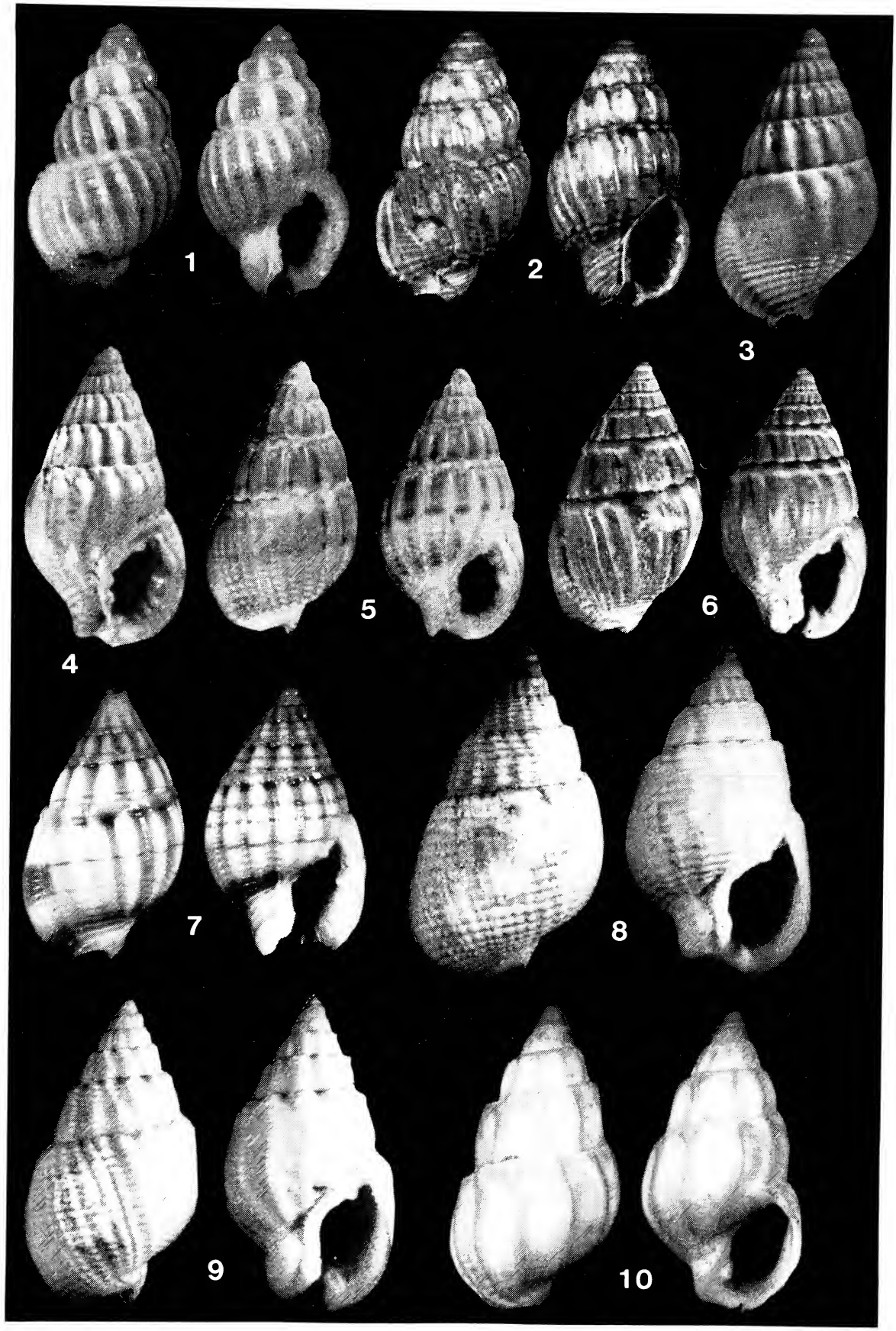
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PLATE 35

Fig. 1. *Nassarius (Zeuxis) abyssicolus* (A.Adams). Holotype BM(NH) No. 197310; 7.7 mm.

Figs.2,3. *N. (Z.) abyssicolus* (A.Adams). Sand I, Oahu, Hawaiian Is; 13.9 mm and 13.6 mm respectively.

Fig. 4. *N. (Z.) alfuricus* (Fischer in Wanner). Type-figure; 6.0 mm (from Fischer in Wanner, 1927, pl.213, fig.46).

Fig. 5. *N. (Z.) alfuricus* (Fischer in Wanner). Laing I, Hansa Bay, Papua New Guinea; 5.5 mm.

Fig. 6. *N. (Z.) noguchii* (Habe). Holotype NSMT No. 38612; 15.3 mm.

Fig. 7. *N. (Z.) nakayamai* (Habe). Holotype NSMT No. 39780; 12.0 mm.

Fig. 8. *N. (Varicinassa) variciferus* (A.Adams). Lectotype BM(NH) No. 1973151; 29.0 mm.

Fig. 9. *N. (V.) variciferus* (A.Adams). Kiangsu, China; 23.4 mm.

Fig. 10. *N. (Zeuxis) pulvinaris* (von Martens). Holotype ZMHU; 23.0 mm. Teratological specimen.

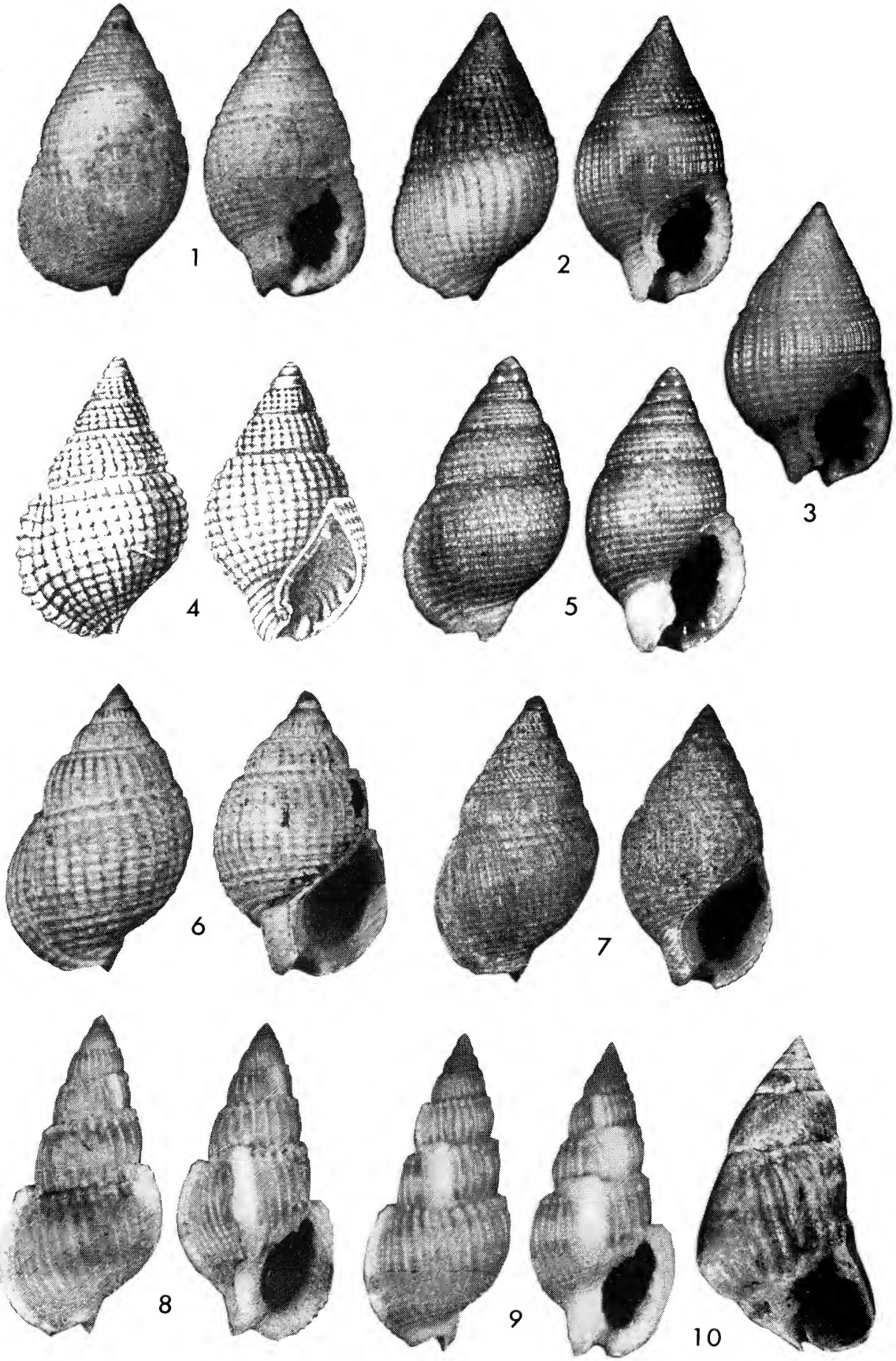
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PLATE 36

Fig. 1. *Nassarius (Profundinassa) babylonicus* (Watson). Lectotype BM(NH) No. 1887.2.9.636; 10.3 mm.

Fig. 2. *N. (P.) babylonicus* (Watson). Type-figure of *Nassa turrifera* E.A.Smith; 10.0 mm (from E.A.Smith, 1895a, pl.1,fig.6).

Fig. 3. *N. (P.) babylonicus* (Watson). E. of Dodepo I, Celebes, Indonesia; 13.3 mm. Specimen with periostracum.

Fig. 4. *N. (P.) babylonicus* (Watson). Indian Seas, 458 m; 11.0 mm.

Fig. 5. *N. (P.) omuensis* (Noda). Type-figure; 9.2 mm (from Noda, 1980, pl.10, figs.1,24).

Fig. 6. *N. (P.) dilutus* (E.A.Smith). Type-figure; 12.0 mm. (from Annandale & Stewart, 1901, pl.11,fig.3).

Fig. 7. *N. (P.) dilutus* (E.A.Smith). Type-figure of *Profundinassa pupa* Okutani; 10.0 mm (from Okutani, 1968, pl.3,fig.8).

Fig. 8. *N. (P.) dilutus* (E.A.Smith). Arafura Sea, 1788 m; 11.0 mm.

Fig. 9. *N. (P.) dilutus* (E.A.Smith). E. of Dodepo I, Celebes, Indonesia; 1241 m; 12.7 mm.

Fig. 10. *N. (P.) patricius* (Thiele). Holotype ZMHU; 3.7 mm.

Figs.11,12. *N. (P.) infralaevis* (Fischer in Wanner). Type-figure; 5.0 mm. 11. Shell. 12. Protoconch (after Fischer in Wanner, 1927, pl.213,fig.47).

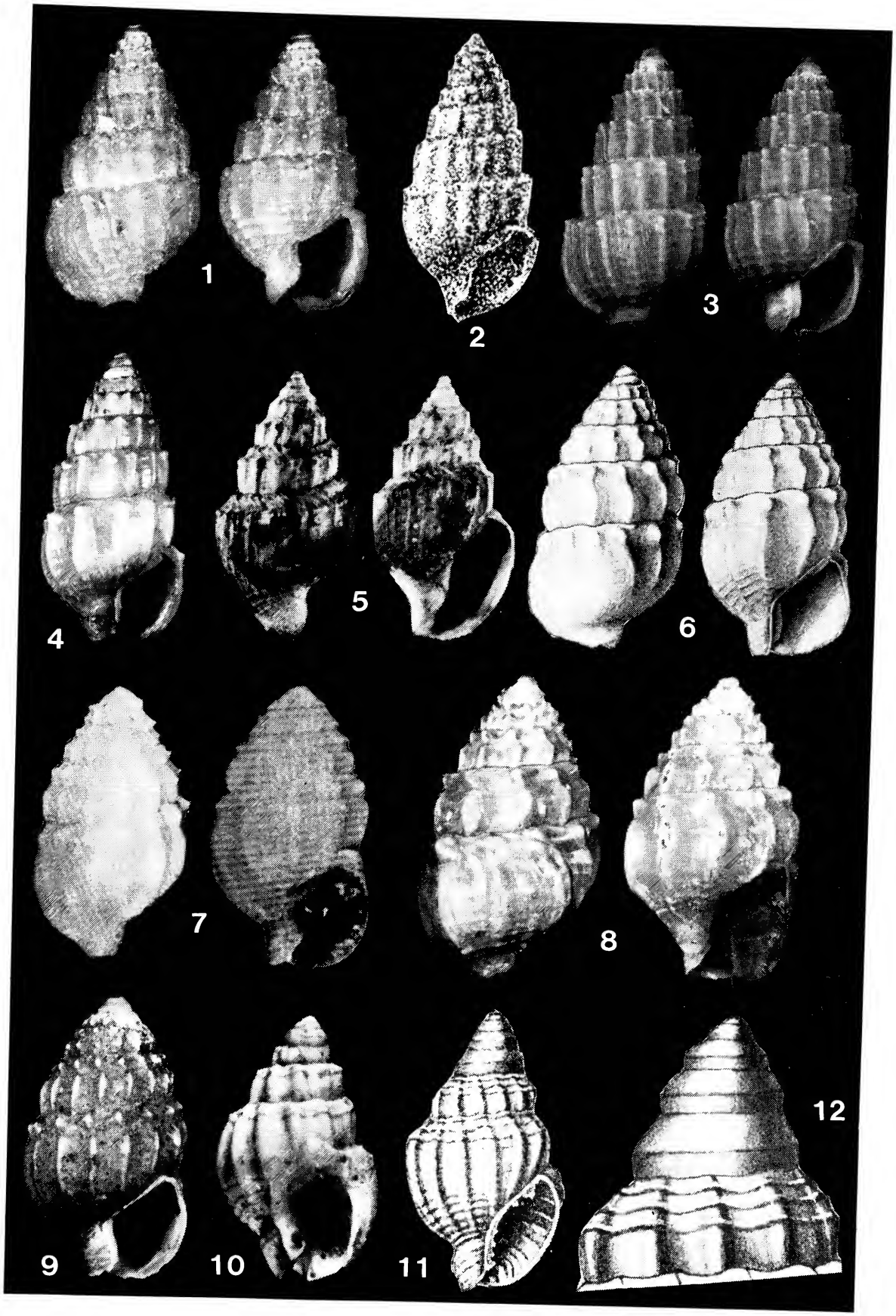
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PLATE 37

Fig. 1. *Nassarius (Hima) pauperus* (Gould). Immature holotype USNM-5726; 9.1 mm.

Fig. 2. *N. (H.) pauperus* (Gould). Immature holotype of *Nassa luteola* E.A.Smith, BM(NH) No. 1878.11.7.39; 7.4 mm.

Fig. 3. *N. (H.) pauperus* (Gould). Lectotype of *Arcularia pilata* Hedley, AMS No.C-8071; 6.0 mm.

Fig. 4. *N. (H.) pauperus* (Gould). Syntype of *Nassa erythraea* Issel, MNHNP; 8.0 mm.

Figs.5,6. *N. (H.) pauperus* (Gould). Syntype of *Nassa tringa* Souverbie, MNHNP 9.6 mm. Broad form.

Fig. 7. *N. (H.) pauperus* (Gould). Holotype of *Nassa mamillata* Preston, BM(NH) No. 1923.2.20.8; 9.0 mm. Very broad form.

Fig. 8. *N. (H.) pauperus* (Gould). Holotype of *Nassa dermestina* Gould, USNM-24166; 7.0 mm. Slender form.

Fig. 9. *N. (H.) pauperus* (Gould). Lectotype of *Nassa plebecula* Gould, USNM-24168; 10.3 mm. Slender form.

Fig. 10. *N. (H.) pauperus* (Gould). Type-figure of *Nassa balteata* Pease; 8.5 mm. (from Pease, 1869, pl.8,fig.5). Slender, banded form.

Fig. 11. *N. (H.) pauperus* (Gould). Immature holotype of *Nassa microstoma* Pease, BM(NH) No. 1961458; 9.0 mm. Slender, banded form.

Fig. 12. *N. (H.) pauperus* (Gould). Off Mahe I, Seychelles Is; 10.6 mm. Slender, banded form.

Fig. 13. *N. (H.) pauperus* (Gould). Type-figure of *Nassa gregaria* Grabau & King (from Grabau & King, 1928, pl.8,fig.71). Slender, banded form.

Fig. 14. *N. (H.) pauperus* (Gould). Holotype of *Nassa producta* Sowerby, BM(NH) No. 1899.4.14.3604; 13.7 mm. Very slender form.

Fig. 15. *N. (H.) rotundus* (Melvill & Standen). Holotype University of Manchester Museum; 5.6 mm.

Figs.16,17. *N. (H.) rotundus* (Melvill & Standen). Topotype from Lifu I, Loyalty Is; 6.8 mm.

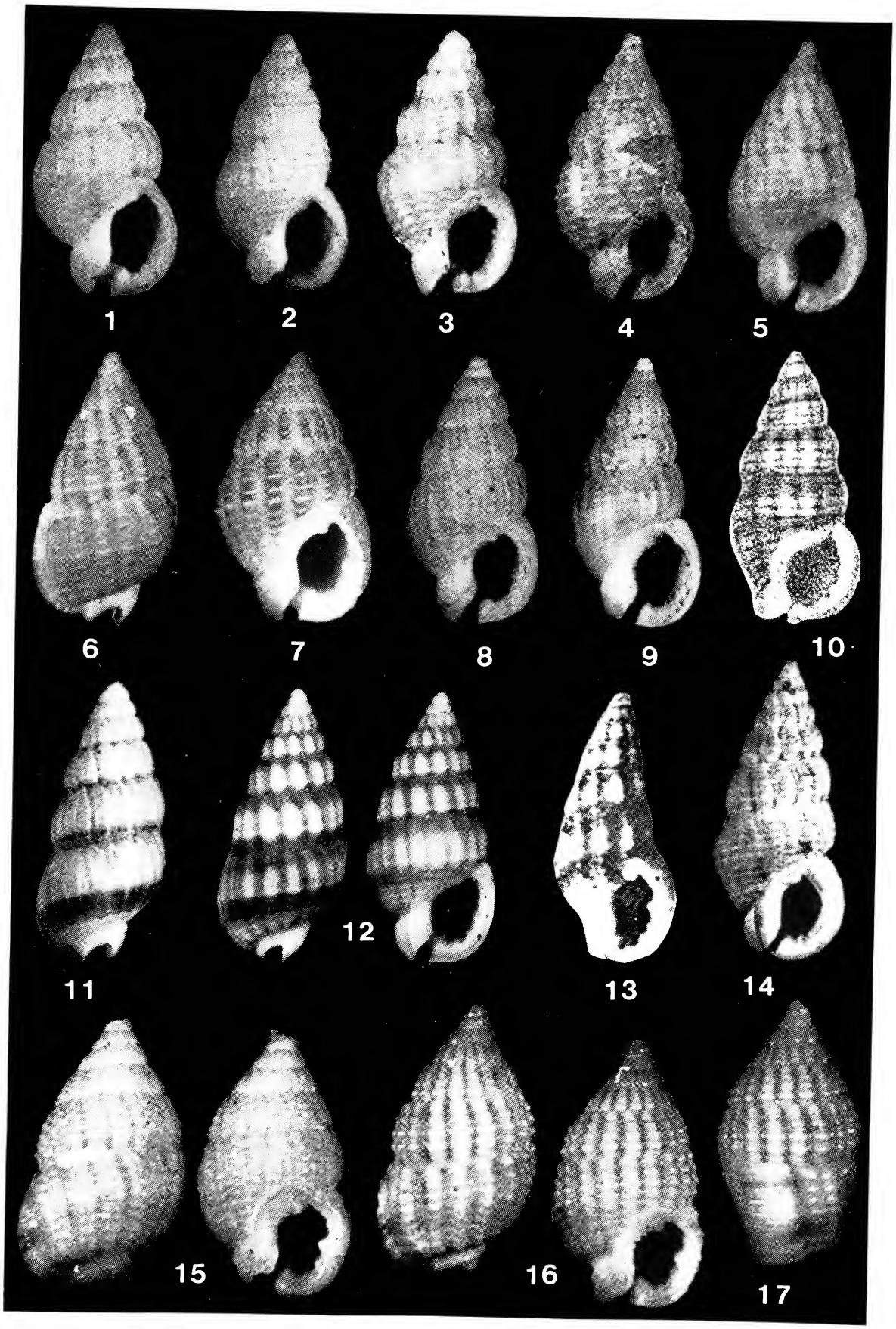
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PLATE 38

Fig. 1. *Nassarius (Hima) crenulicostatus* (Shuto). Type-figure; 5.7 mm (from Shuto, 1969, pl.17,figs.8,9).

Fig. 2. *N. (H.) crenulicostatus* (Shuto). Punta Engano, Mactan I, Cebu, Philippines; 6.5 mm.

Figs.3,4. *N. (H.) fuscolineatus* (E.A.Smith). Holotype BM(NH) No. 1873.8.6.41; 9.0 mm. Broad specimen.

Fig. 5. *N. (H.) fuscolineatus* (E.A.Smith). Lectotype of *Nassa fraterminor* Pilsbry, Academy Natural Sciences, Philadelphia No.70704; 10.6 mm.

Fig. 6. *N. (H.) fuscolineatus* (E.A.Smith). Lectotype of *Nassa fraterminor* Pilsbry, Academy Natural Sciences, Philadelphia No. 70704; 11.6 mm. Slender specimen.

Figs.7,8. *N. (H.) praematuratus* (Kuroda & Habe). Juvenile holotype NSMT No. 39796; 4.7 mm.

Fig. 9. *N. (H.) praematuratus* (Kuroda & Habe). Holotype of *Nassa tenuis* E.A.Smith, BM(NH) No. 1873.8.6.40; 12.5 mm.

Fig. 10. *N. (H.) praematuratus* (Kuroda & Habe). Japan; 11.0 mm.

Fig. 11. *N. (H.) quantulus* (Gould). Juvenile holotype USNM-224; 6.2 mm.

Fig. 12. *N. (H.) quantulus* (Gould). Paratype of *Nassa muiri* Barnard, BM(NH) No. 1962287; 9.2 mm.

Fig. 13. *N. (H.) quantulus* (Gould). Type-figure of *Nassa carinata* Turton; 11.0 mm (from Turton, 1932, pl.13,fig.419).

Figs.14,15. *N. (H.) quantulus* (Gould). Cape St.Blaize Province, Sth. Africa; 10.9 mm and 12.1 mm respectively.

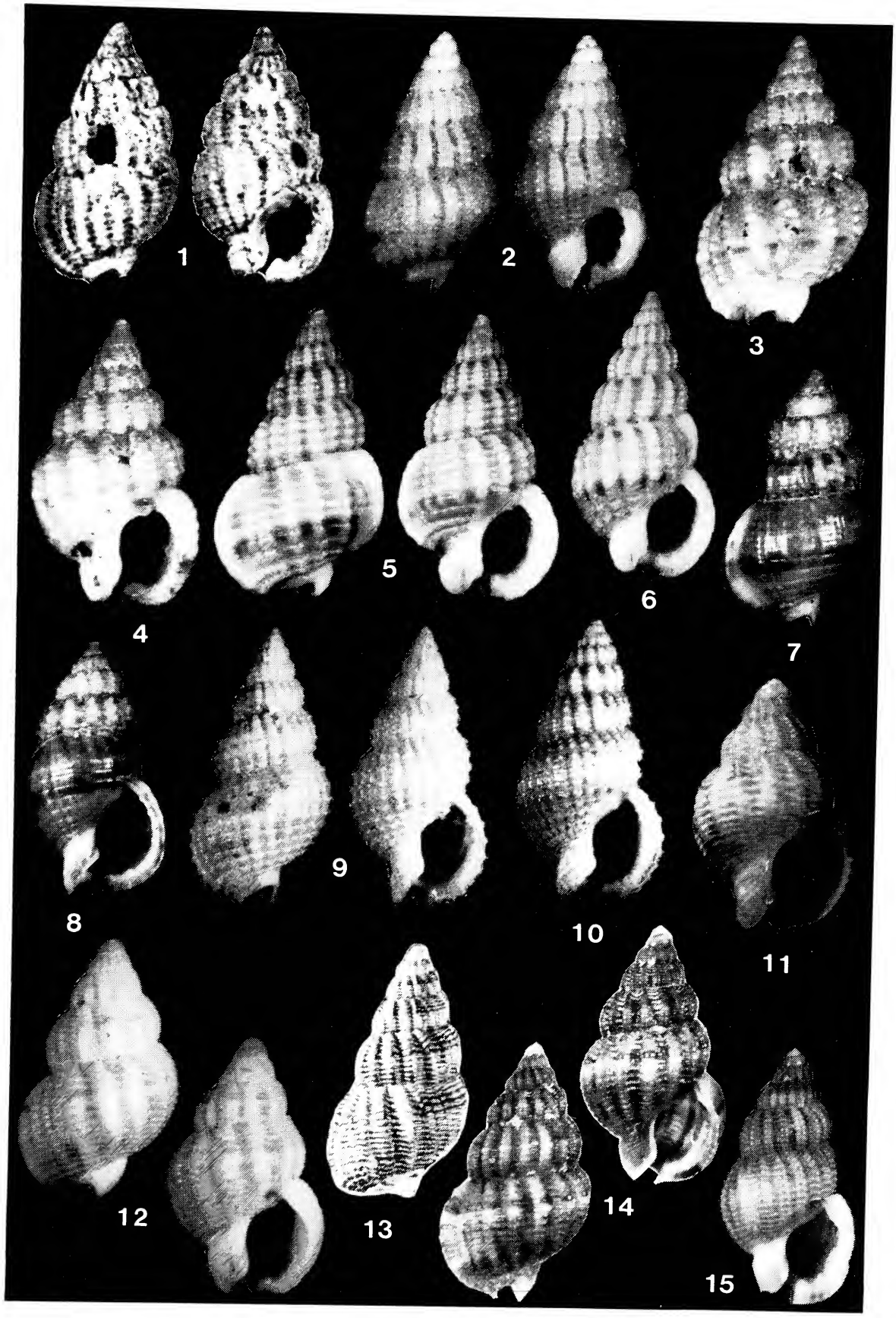
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PLATE 39

Fig. 1. *Nassarius (Hima) multigranosus* (Dunker). Lectotype ZMHU; 9.6 mm. Broad form.

Fig. 2. *N. (H.) multigranosus* (Dunker). Paralectotype ZMHU; 10.0 mm. Slender form.

Fig. 3. *N. (H.) multigranosus* (Dunker). Holotype of *Nassa spurca* Gould, USNM No. C-1661; 10.2 mm. Broad form.

Fig. 4. *N. (H.) multigranosus* (Dunker). Type-figure of *Nassa dominula* Tapparone-Canefri (from Tapparone-Canefri, 1874, pl.1,fig.17). Broad form.

Fig. 5. *N. (H.) multigranosus* (Dunker). Holotype of *Nassa acutidentata* E.A.Smith, BM(NH) No. 1873.11.7.36; 10.0 mm. Slender form.

Fig. 6. *N. (H.) multigranosus* (Dunker). Misaki, Japan; 10.4 mm. Broad form.

Figs.7,8. *N. (H.) multigranosus* (Dunker). Type-specimens of *Nassa chibi* Habe, NSMT No. 39777. 7. Juvenile holotype; 6.2 mm. 8. Paratype; 6.4 mm.

Fig. 9. *N. (H.) fraterculus* (Dunker). Lectotype ZMHU; 10.7 mm.

Fig. 10. *N. (H.) fraterculus* (Dunker). Type-figure of *Nassa semiplicata* Reeve (from Reeve, 1853-54, pl.12,fig.78).

Fig. 11. *N. (H.) fraterculus* (Dunker). Holotype of *Nassa nodosa* Marrat, Merseyside County Museum, Liverpool; 16.7 mm. Coarsely sculptured form.

Fig. 12. *N. (H.) fraterculus* (Dunker). Lectotype of *Nassa hiradoensis* Pilsbry, Academy Natural Sciences, Philadelphia, No. 85999; 15.9 mm. Coarsely sculptured form.

Fig. 13. *N. (H.) fraterculus* (Dunker). Lectotype of *Nassa hypolia* Pilsbry, Academy Natural Sciences, Philadelphia, No.70705; 11.0 mm. Smooth form.

Fig. 14. *N. (H.) fraterculus* (Dunker). Lectotype of *Nassa hizenensis* Pilsbry, Academy Natural Sciences, Philadelphia, No. 85996; 11.0 mm. Intermediate slender form.

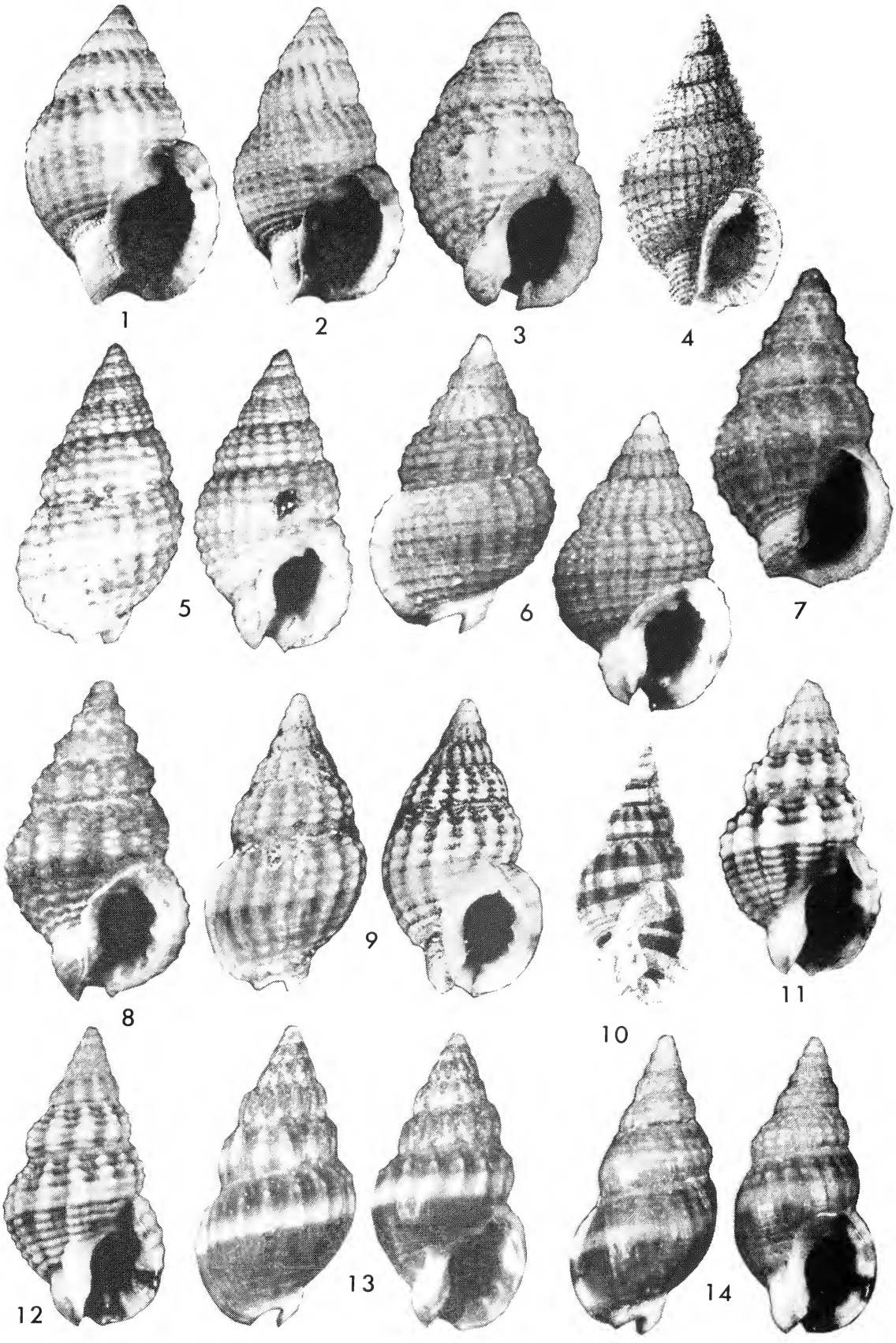
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PLATE 40

Fig. 1. *Nassarius (Hima) kochianus* (Dunker). Lectotype ZMHU; 10.3 mm.

Fig. 2. *N. (H.) kochianus* (Dunker). Paralectotype ZMHU; 8.9 mm.

Fig. 3. *N. (H.) kochianus* (Dunker). Syntype of *Buccinum signatum* Dunker, ZMHU; 10.9 mm.

Fig. 4. *N. (H.) kochianus* (Dunker). Lectotype of *Nassa crawfordi* Sowerby, BM(NH) No. 1899.4.14.3676; 9.8 mm.

Fig. 5. *N. (H.) kochianus* (Dunker). Holotype of *Nassa poecilosticta* E.A.Smith, BM(NH) No. 1894.4.14.464; 13.8 mm.

Fig. 6. *N. (H.) kochianus* (Dunker). Port Alfred, Sth. Africa; 12.0 mm.

Fig. 7. *N. (H.) plebejus* (Thiele). Lectotype ZMHU; 6.2 mm.

Fig. 8. *N. (H.) plebejus* (Thiele). Pt. Elizabeth, Sth. Africa. Natal Museum, Pietermaritzburg No.B-390; 8.2 mm.

Fig. 9. *N. (H.) capensis* (Dunker). Lectotype ZMHU; 14.3 mm.

Fig. 10. *N. (H.) capensis* (Dunker). Lectotype of *Nassa pulchella* A.Adams, BM(NH); 16.3 mm.

Fig. 11. *N. (H.) capensis* (Dunker). Holotype of *Nassa serotina* A.Adams, BM(NH) No.1973149; 16.0 mm.

Fig. 12. *N. (H.) formosus* (Turton). Type-figure; 9.0 mm (from Turton, 1932, pl.12, fig.409).

Fig. 13. *N. (H.) formosus* (Turton). Coffee Bay, Sth. Africa. Natal Museum, Pietermaritzburg; 8.2 mm.

Fig. 14. *N. (H.) formosus* (Turton). Shelly Beach, Natal, Sth. Africa; 5.9 mm and 6.0 mm respectively.

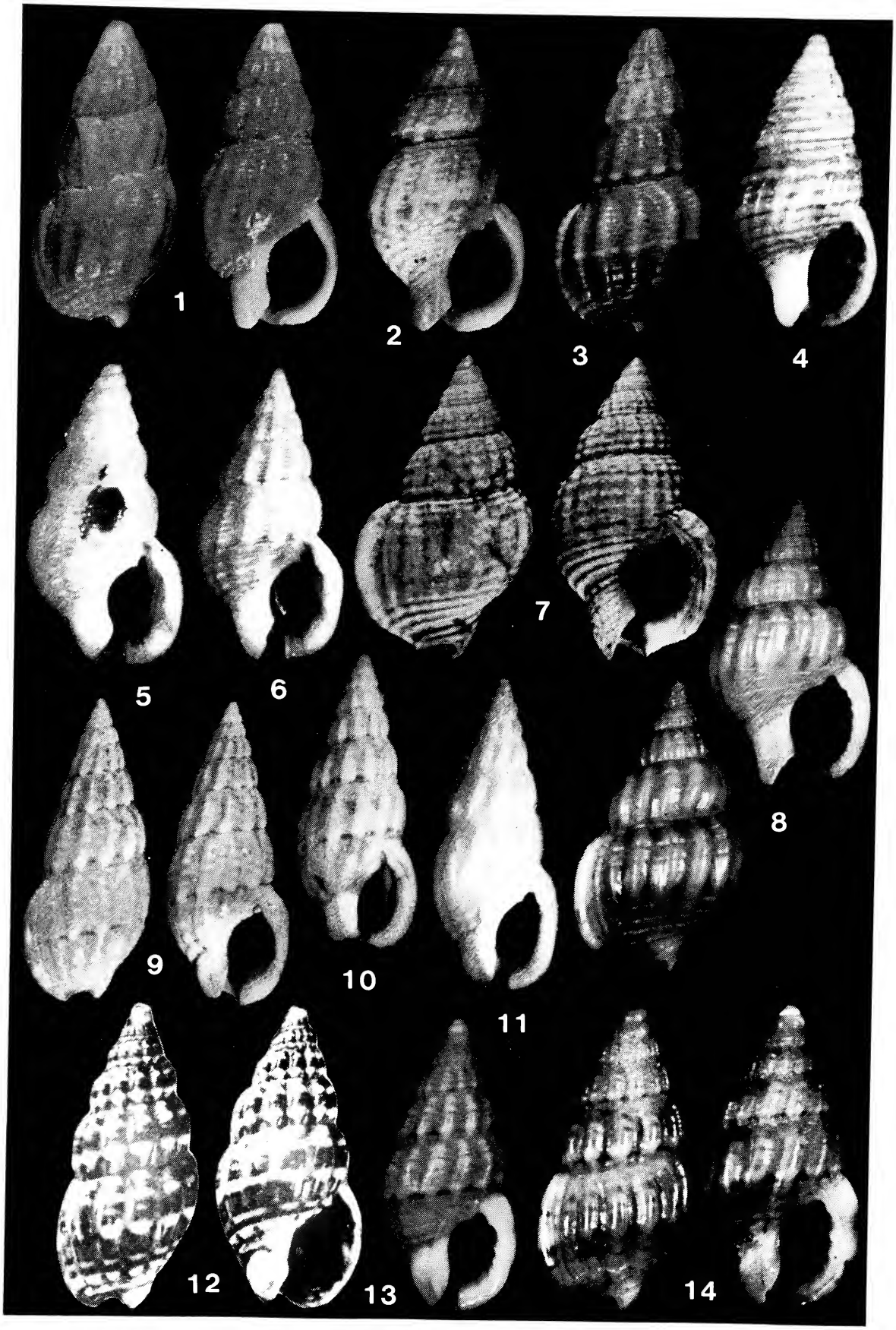
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PLATE 41

Fig. 1. *Nassarius (Allanassa) eximius* (H.Adams). Lectotype BM(NH) No. 1878.1.28.31; 8.1 mm.

Fig. 2. *N. (A.) eximius* (H.Adams). Dry Creek Beach. S.E. Efate I, Vanuatu; 8.0 mm. Immature specimen.

Figs.3,4. *N. (Aciculina) vittatus* (A.Adams). Holotype BM(NH) No. 1973162; 11.4 mm. Axially ribbed form.

Fig. 5. *N. (A.) vittatus* (A.Adams). Lectotype of *Nassa glabrata* A.Adams, BM(NH) No. 1973161; 13.0 mm. Smooth form.

Fig. 6. *N. (A.) vittatus* (A.Adams). Lectotype of *Nassa maculata* A.Adams, BM(NH) No. 1973161; 13.0 mm. Smooth form.

Fig. 7. *N. (A.) vittatus* (A.Adams). Type-figure of *N.steenhuisi* Oostingh; 9.3 mm (from Oostingh, 1939, pl.15,fig.263).

Fig. 8. *N. (A.) vittatus* (A.Adams). Rabaul, Papua New Guinea; 12.8 mm. Smooth form.

Fig. 9. *N. (A.) vittatus* (A.Adams). Cap la Houssaye, Reunion I; 10.4 mm. Intermediate form.

Fig. 10. *N. (A.) vittatus* (A.Adams). Cabra I, Philippines; 12.0 mm. Axially ribbed form.

Fig. 11. *N. (A.) labiatus* (A.Adams). Lectotype BM(NH) No. 197345; 14.2 mm.

Fig. 12. *N. (H.) labiatus* (A.Adams). Holotype of *Nassa costata* A.Adams and *N.terebroides* Reeve, BM(NH) No. 197360; 15.1 mm.

Fig. 13. *N. (A.) labiatus* (A.Adams). Yasawa Is, Fiji Is; 13.3 mm.

Fig. 14. *N. (A.) teretiusculus* (A.Adams). Immature lectotype BM(NH) No. 1973180; 13.3 mm.

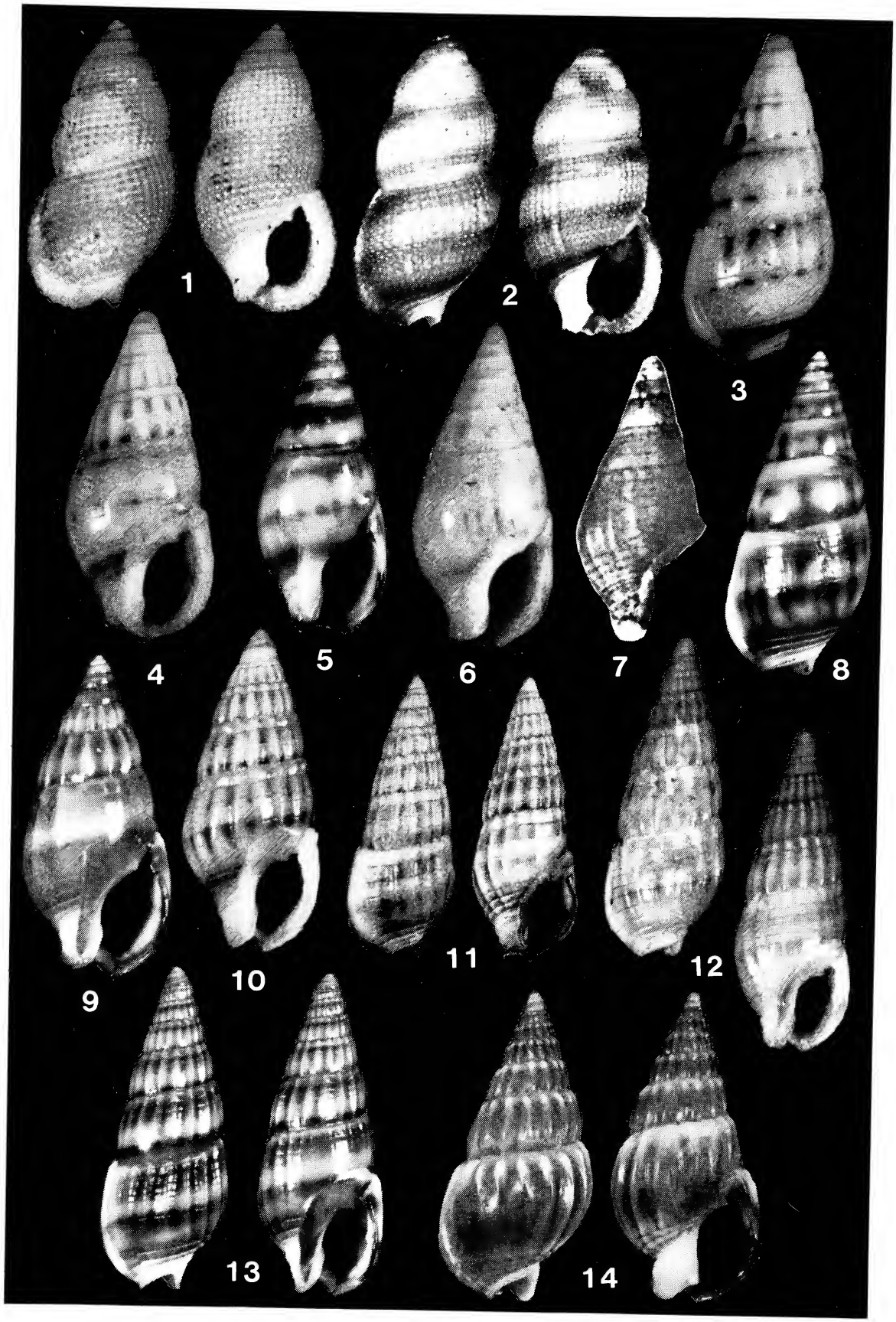
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PLATE 42

Fig. 1. *Nassarius (Aciculina) teretiusculus* (A.Adams). Type-figure of *N. mantjeuriensis* Oostingh; 8.8 mm (from Oostingh, 1939, pl.15,fig.269).

Fig. 2. *N. (A.) teretiusculus* (A.Adams). Telok Beloh, Sarawak, Malaysia; 11.6 mm.

Fig. 3. *N. (A.) teretiusculus* (A.Adams). Lantow I, Hong Kong; 11.6 mm.

Fig. 4. *N. (A.) nobilis* (Thiele). Holotype ZMHU; 7.6 mm.

Fig. 5. *N. (A.) nobilis* (Thiele). Type-figure of *N.insulindicus* Oostingh; 12.0 mm (from Oostingh, 1933, textfig. 3).

Fig. 6. *N. (A.) nobilis* (Thiele). Type-figure of *N.bodjongensis* Oostingh; 7.6 mm. Immature specimen (from Oostingh, 1939, pl.15,fig.273).

Fig. 7. *N. (A.) fennemai* Oostingh. Type-figure; 6.0 + mm (from Oostingh, 1939, pl. 15, fig.268).

Fig. 8. *N. (A.) sumatranus* (Thiele). Holotype ZMHU; 6.8 mm.

Fig. 9. *N. (A.) sumatranus* (Thiele). Mindoro I, Philippines; 8.5 mm.

Fig. 10. *N. (A.) moestus* (Hinds). Lectotype BM(NH) No. 1844.9.23.3; 9.5 mm.

Fig. 11. *N. (A.) moestus* (Hinds). Worn holotype of *Nassa anthracina* Garrett, Academy of Natural Sciences, Philadelphia, No.16261; 6.7 mm.

Fig. 12. *N. (A.) moestus* (Hinds). Holotype of *Nassa tristis* Preston, ZSI No. M-4013/1; 10.1 mm.

Fig. 13. *N. (A.) moestus* (Hinds). Lolovai, Aoba, Vanuatu; 9.7 mm.

Fig. 14. *N. (A.) moestus* (Hinds). Rabaul, Papua New Guinea; 8.2 mm.

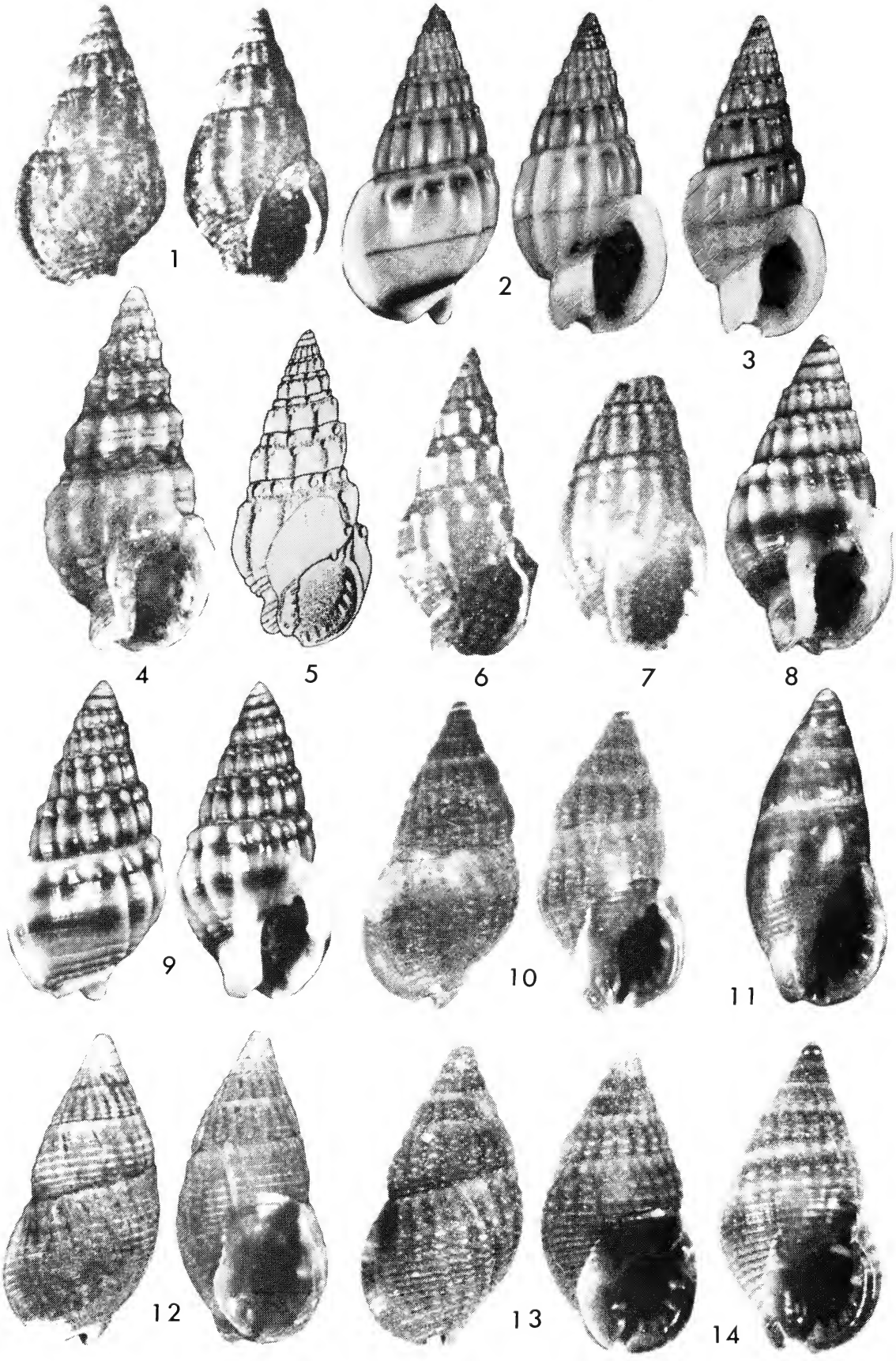
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PLATE 43

Fig. 1. *Nassarius (Aciculina) pupinoides* (Reeve). Lectotype of *Nassa striata* A.Adams and *N.pupinoides* Reeve, BM(NH) No. 197354; 10.5 mm.

Fig. 2. *N. (A.) pupinoides* (Reeve). Lectotype of *Nassa cebuensis* Sowerby, BM(NH) No. 1901.10.3.26.; 12.7 mm.

Fig. 3. *N. (A.) pupinoides* (Reeve). Mactan I, Philippines; 10.5 mm.

Fig. 4. *N. (A.) pupinoides* (Reeve). Paralectotype (Reeve's specimen); BM(NH); 10.0 mm.

Fig. 5. *N. (A.) ischnus* (Melvill). Lectotype BM(NH) No. 1899.12.18.40.; 9.7 mm.

Fig. 6. *N. (Pygmaeonassa) orissaensis* (Preston). Type-figure; 6.25 mm (from Preston, 1914, textfig.10).

Figs.7,8. *N. (P.) orissaensis* (Preston). Holotype of *Nassa ennurensis* Preston, ZSI No. 10072/2; 10.3 mm.

Fig. 9. *N. (P.) orissaensis* (Preston). Holotype of *Nassa depauperata* Annandale & Prashad, ZSI No. 11488/2; 5.8 mm.

Fig. 10. *N. (P.) fossae* (Preston). Type-figure; 9.5 mm (from Preston, 1915, textfig.1).

Figs.11,12. *N. (P.) subconstrictus* (Sowerby). Type-figure; 10.0 mm. Intermediate form (from Sowerby, 1899, textfig.).

Fig. 13. *N. (P.) subconstrictus* (Sowerby). Type-figure of *Nassa denegabilis* Preston; 11.0 mm. Slender form (from Preston, 1914, textfig. 9).

Fig. 14. *N. (P.) subconstrictus* (Sowerby). Holotype of *Nassa gangetica* Preston, BM(NH) No. 1905.2.8.11.; 10.7 mm. Intermediate form.

Fig. 15. *N. (P.) subconstrictus* (Sowerby). Puri, India; 7.9 mm. Broad form.

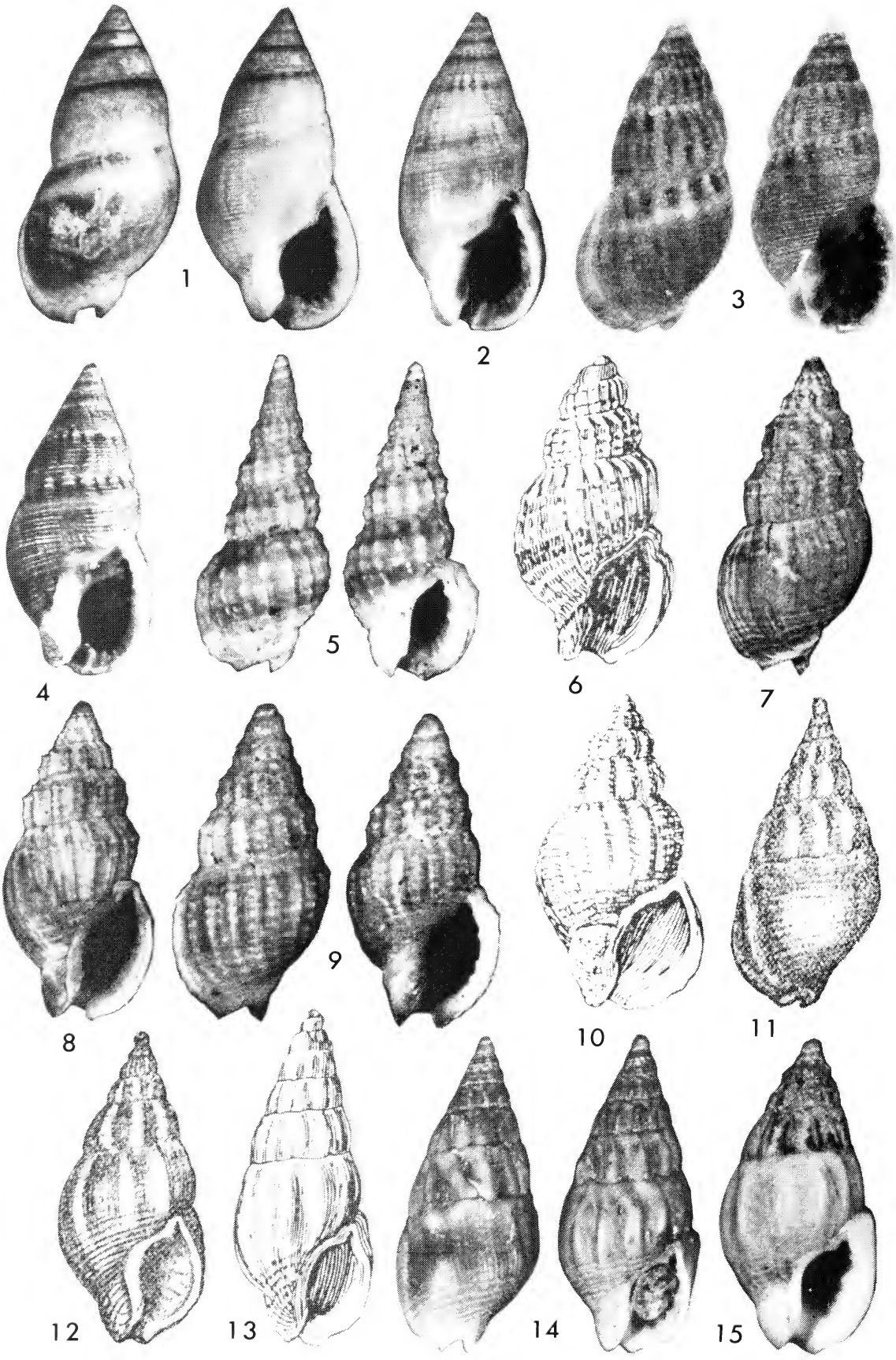
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PLATE 44

Fig. 1. *Hebra horrida* (Dunker). Syntype ZMHU; 13.8 mm.

Fig. 2. *H. Horrida* (Dunker). Type-figure of *Buccinum muricatum* Quoy & Gaimard (from Quoy & Gaimard, 1833, pl.32,figs.32,33).

Fig. 3. *H. horrida* (Dunker). Lectotype of *Nassa curta* Gould, USNM-5722; 11.4 mm.

Fig. 4. *H. horrida* (Dunker). Karoni I, Lau group, Fiji Is; 13.1 mm.

Fig. 5. *H. subspinosa* (Lamarck). Lectotype Museum d'Histoire Naturelle, Geneva, No. 1102/6/1; 14.0 mm.

Figs.6,7. *H. subspinosa* (Lamarck). Pantai Pura, W. Timor, Indonesia; 14.4 mm.

Fig. 8. *H. subspinosa* (Lamarck). Type-figure of *Nassa sistroidea* G. & H.Nevill; 17.0 mm (from G. & H.Nevill, 1874, pl.1,fig.6).

Fig. 9. *H. subspinosa* (Lamarck). Enggano I, Sth. of Sumatra, Indonesia; 15.4 mm. Non-echinate specimen.

Figs.10,11. *H. corticata* (A.Adams). Lectotype BM(NH) No. 197326; 11.7 mm. Smooth specimen with obsolete axial ribs.

Fig. 12. *H. corticata* (A.Adams). Lectotype of *Nassa lirata* Marrat, Merseyside County Museum, Liverpool; 17.0 mm.

Fig. 13. *H. corticata* (A.Adams). Lectotype of *Nassa sculpta* Marrat, Merseyside County Museum, Liverpool; 13.0 mm.

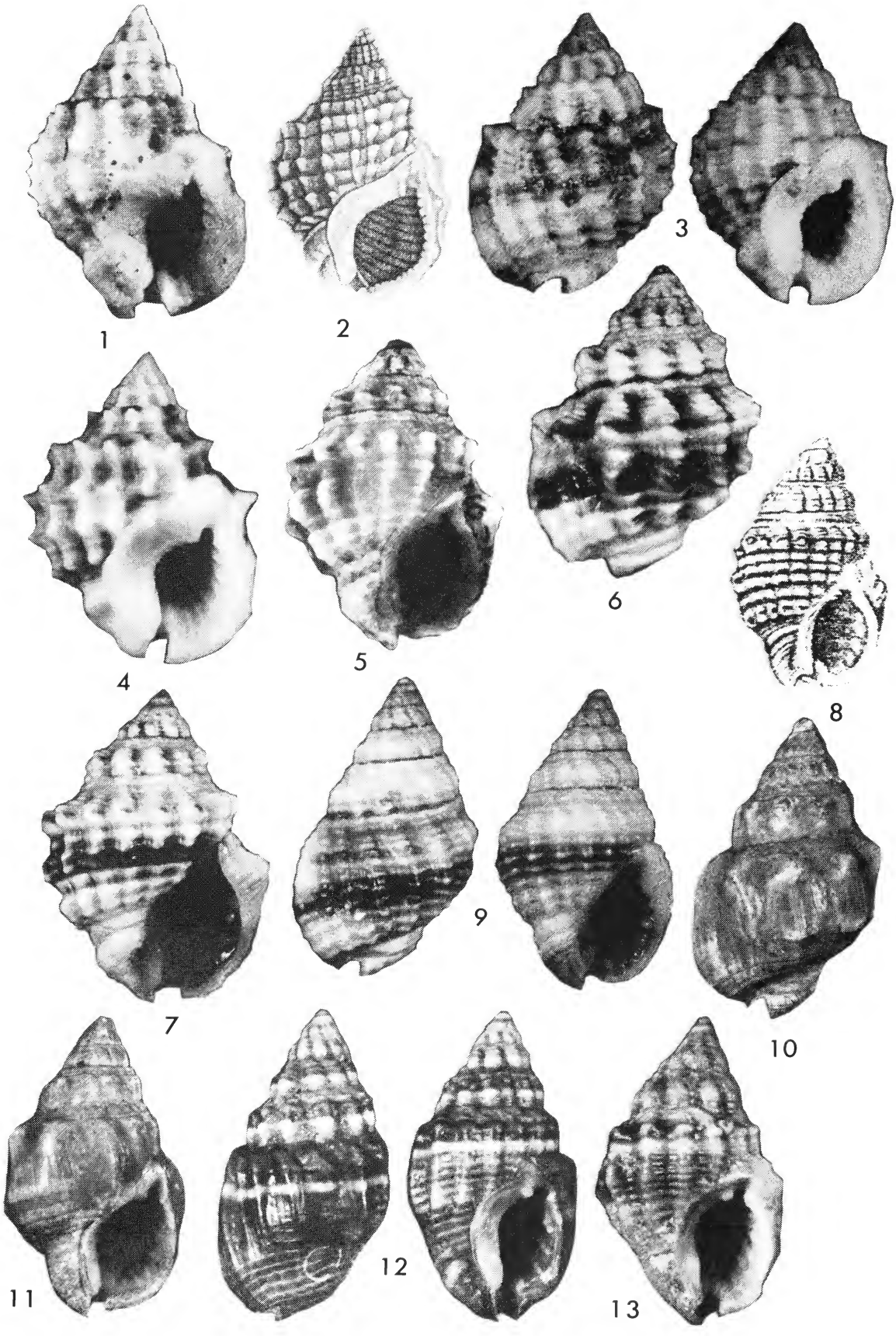
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PLATE 45

Fig. 1. *Hebra corticata* (A.Adams). Holotype of *Nassa trinodosa* E.A.Smith, BM(NH) No. 1973168; 13.0 mm.

Fig. 2. *H. corticata* (A.Adams). Syntype of *Nassa vibex* Reeve and *N. solida* Hidalgo, BM(NH); 17.8 mm. Echinate form.

Figs.3-5. *H.corticata* (A.Adams). Pantai Pura, N. of Kupang, W. Timor, Indonesia. 3,4. 14.6 mm. 5. 15.5 mm. Echinate form.

Figs.6,7. *H. oberwimmeri* (Preston). Holotype of *Nassa exigua* Rousseau, MNHNP; 13.0 mm.

Fig. 8. *H. oberwimmeri* (Preston). Holotype BM(NH) No. 1923.2.20.9; 9.8 mm.

Fig. 9. *H. oberwimmeri* (Preston). Yasawa group, Fiji Is; 10.0 mm.

Fig. 10. *H. oberwimmeri* (Preston). Vatia wharf, N.W. Viti Levu, Fiji Is; 9.6 mm.

Fig. 11. *Demoulia obtusata* (Link). Illustrated lectotype (from Martini & Chemnitz, 1788, pl.153, fig.1466).

Fig. 12. *D.obtusata* (Link). Holotype of *D.pulchra* Gray, BM(NH) No. 173177; 19.3 mm.

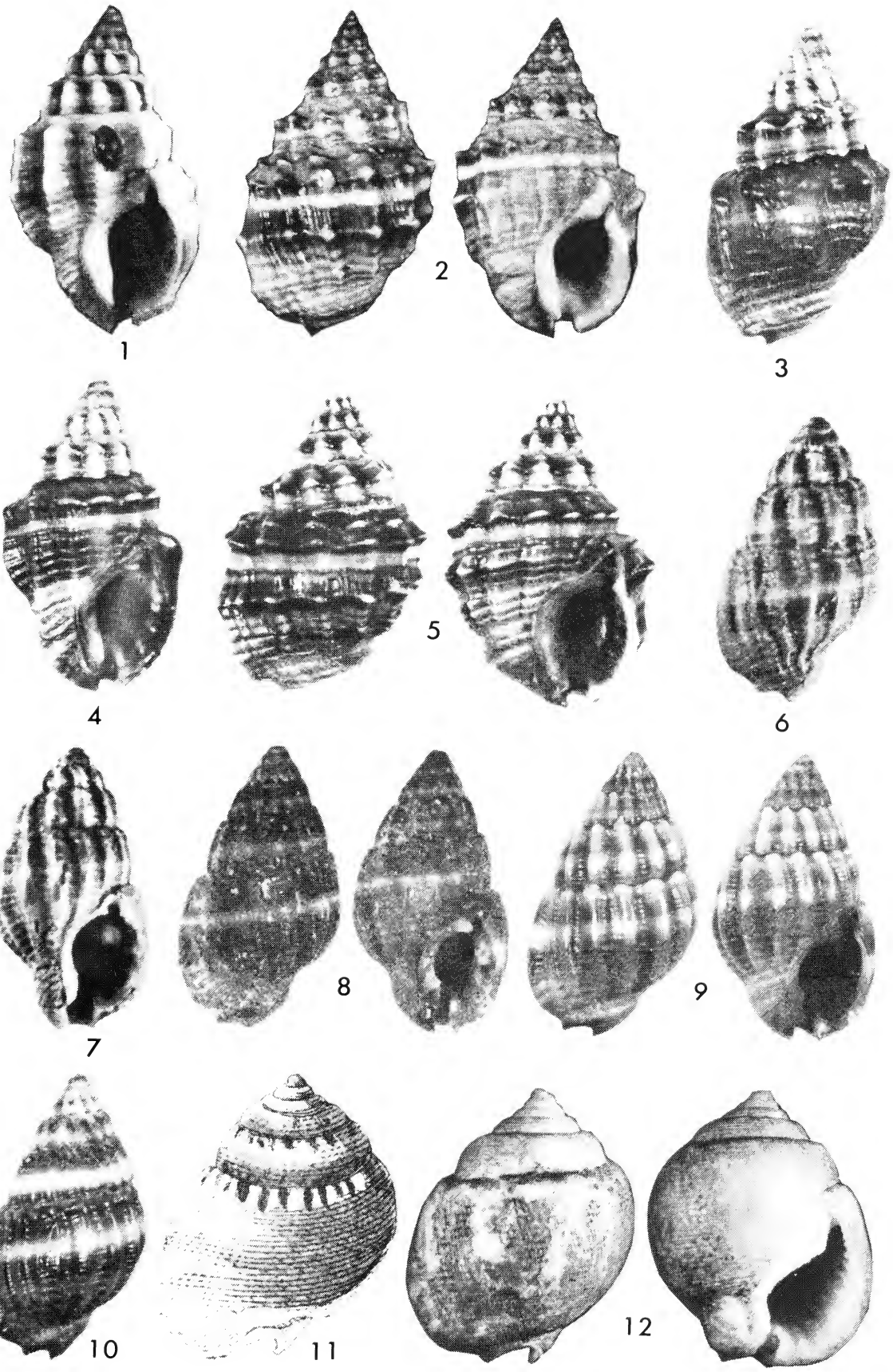
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PLATE 46

Fig. 1. *Demoulia obtusata* (Link). Lectotype of *"Desmoulea" pinguis* A.Adams, BM(NH); 22.0 mm.

Fig. 2. *D. obtusata* (Link). Worn holotype of *"Desmoulea" crassa* A.Adams, and *Nassa ponderosa* Reeve, BM(NH); 22.4 mm.

Fig. 3. *D. obtusata* (Link). Type-figure of *Nassa tryoni* Crosse; 28.0 mm (from Crosse, 1871, pl.1,fig.3).

Fig. 4. *D. abbreviata* (Gmelin). Illustrated lectotype (from Martini & Chemnitz, 1788, pl.153, figs.1463, 1464).

Fig. 5. *D. abbreviata* (Gmelin). Algoa Bay, Sth. Africa; 26.3 mm.

Fig. 6. *D. ventricosa ventricosa* (Lamarck). Type-figure (from Lamarck, 1816, pl.394, fig.3).

Fig. 7. *D. ventricosa ventricosa* (Lamarck). Jeffrey's Bay, Sth. Africa; 25.3 mm.

Fig. 8. *D. ventricosa ventricosa* (Lamarck). Illustration of *Buccinum retusum* Lamarck (from Kiener, 1834-41, pl.24, fig.94).

Fig. 9. *D. ventricosa nataliae* Kilburn. Holotype Natal Museum, Pietermaritzburg, No. 6407; 21.0 mm.

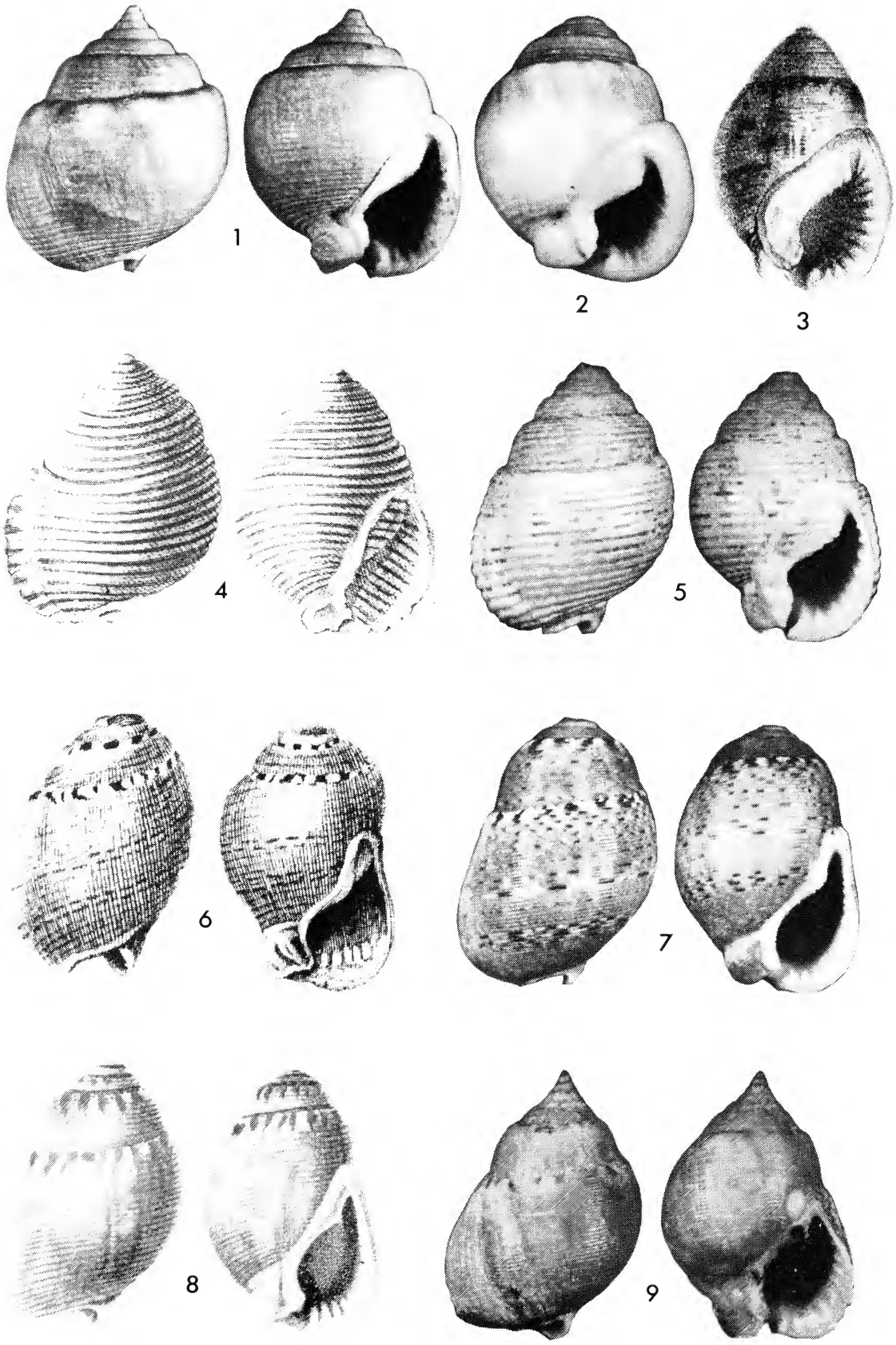
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PLATE 47

Fig. 1. *Cyllene desnoyersi lamarcki* Cernohorsky. Goree, Senegal, W. Africa, 20 m; 17.2 mm.

Fig. 2. *C.desnoyersi lamarcki* Cernohorsky. West Africa; 18.0 mm.

Fig. 3. *C.desnoyersi lamarcki* Cernohorsky. Illustration of *Buccinum lyratum* Lamarck (from Kiener, 1834-41, pl.22,fig.88).

Fig. 4. *C.owenii* Gray in Griffith & Pidgeon. Probable syntype BM(NH); 15.2 mm.

Fig. 5. *C.owenii* Gray in Griffith & Pidgeon. Type-figure of *C.senegalensis* Petit de la Saussaye; 12.0 mm (from Saussaye, 1853, pl.5,fig.5).

Fig. 6. *C.owenii* Gray in Griffith & Pidgeon. West Africa; 15.2 mm.

Fig. 7. *C.grayi* Reeve. Probable holotype BM(NH) No.1966464; 17.4 mm.

Fig. 8. *C.grayi* Reeve. Type-figure of *Buccinum guillaini* Petit de la Saussaye; 24.0 mm. Juvenile specimen (from Saussaye, 1850, pl.7,fig.4).

Fig. 9. *C.grayi* Reeve. Aden. BM(NH) No. 1896.5.6.104-6; 17.3 mm.

Fig. 10. *C.fuscata* A.Adams. Questionable holotype BM(NH); 17.0 mm.

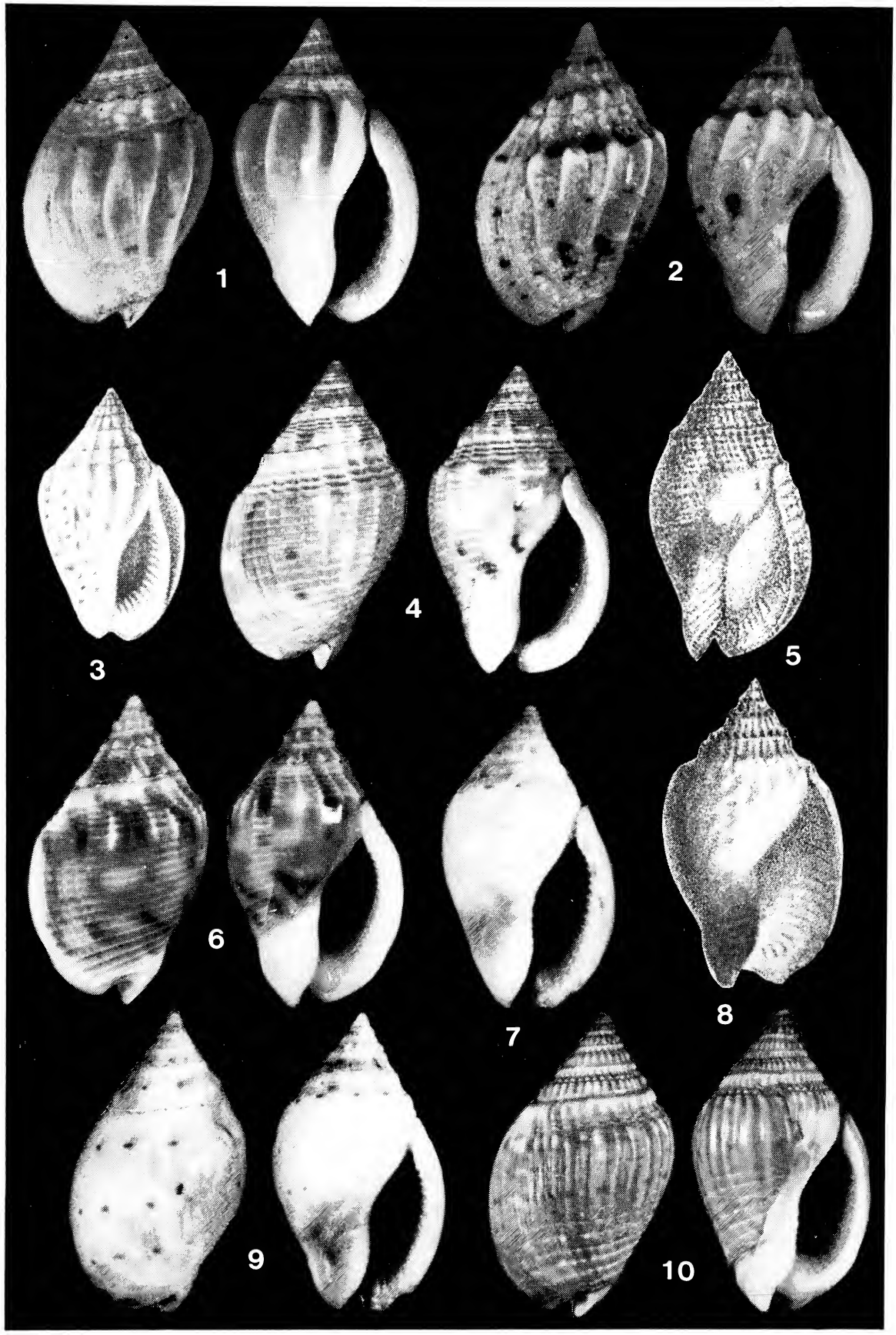
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PLATE 48

Fig. 1. *Cyllene fuscata* A.Adams. Probable syntype of *C. pallida* A.Adams, BM(NH); 17.0 mm.

Fig. 2. *C.fuscata* A.Adams. Lectotype of *C.plumbea* Sowerby, BM(NH); 12.8 mm.

Fig. 3. *C.fuscata* A.Adams. Type-figure of *C.varians* Cossmann; 11.0 mm (from Cossmann, 1903, pl.6,figs.19,20).

Fig. 4. *C.fuscata* A.Adams. Zanzibar, E.Africa. AMS No.C-34418; 16.2 mm. Axially ribbed form.

Fig. 5. *C.fuscata* A.Adams. Negombo, Sri Lanka; 13.1 mm and 12.7 mm respectively. Smooth form.

Fig. 6. *C.unimaculata* A.Adams. Lectotype BM(NH) No.1961136; 11.7 mm.

Fig. 7. *C.unimaculata* A.Adams. Paralectotype BM(NH) No.1961136; 11.6 mm.

Fig. 8. *C.lugubris* Adams & Reeve. Probable syntype BM(NH); 16.0 mm.

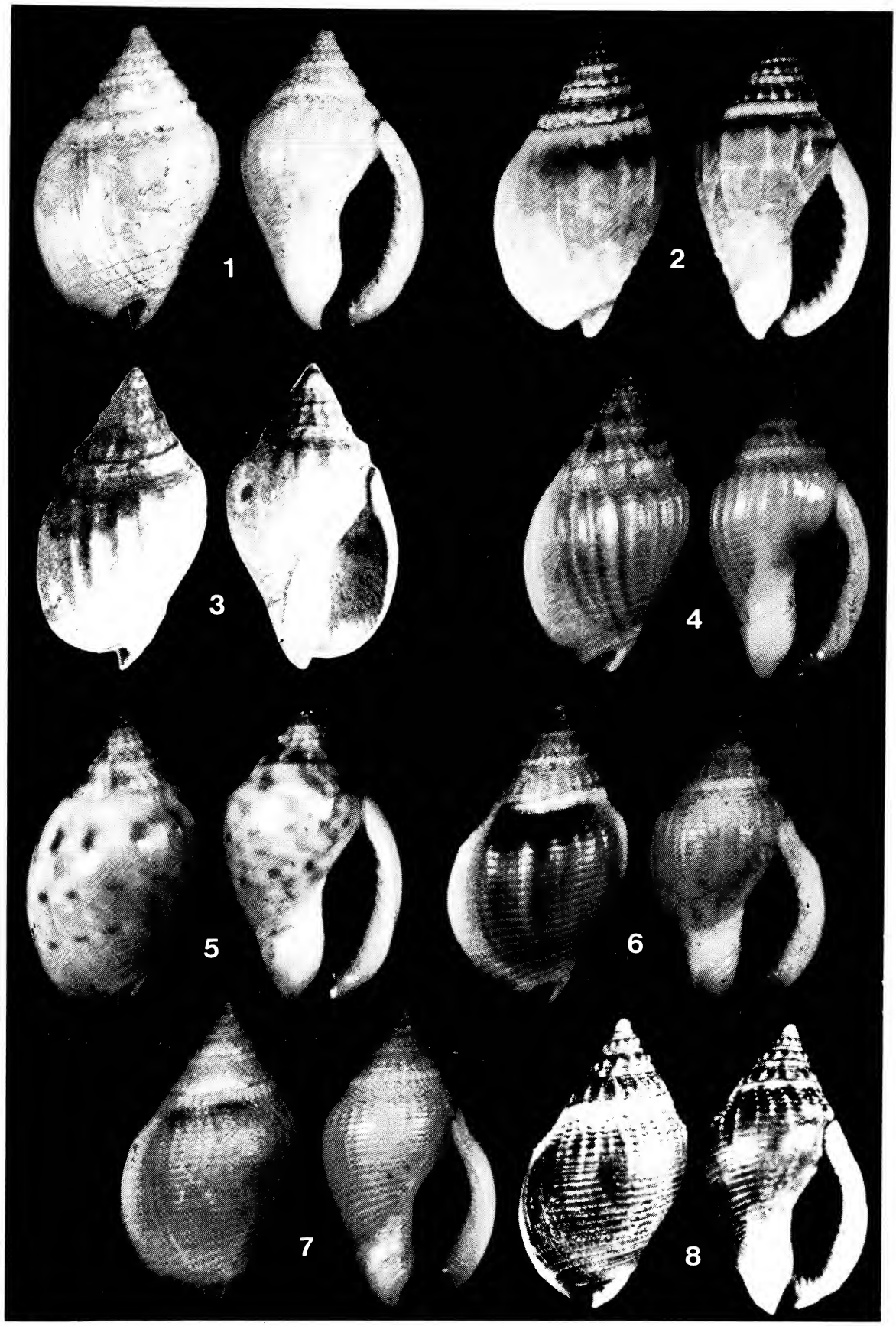
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PLATE 49

Fig. 1. *Cyllene pulchella* Adams & Reeve. Probable holotype BM(NH); 14.8 mm.

Fig. 2. *C.pulchella* Adams & Reeve. Lectotype of *C.striata* A.Adams, BM(NH); 12.2 mm.

Figs.3,4. *C.pulchella* Adams & Reeve. Lectotype of *C.glabrata* A.Adams, BM(NH); 12.5 mm.

Fig. 5. *C.pulchella* Adams & Reeve. Lectotype of *C.oblonga* Schepman, ZMA; 13.4 mm.

Fig. 6. *C.pulchella* Adams & Reeve. Black Sands Beach, Efate I, Vanuatu; 11.0 mm.

Fig. 7. *C.pulchella* Adams & Reeve. Type-figure of *C.bantamensis* Oostingh; 11.5 mm (from Oostingh, 1939, pl.16,figs.293,294).

Fig. 8. *C.pulchella* Adams & Reeve. Mele Beach, Efate I, Vanuatu; 12.7 mm. Coarsely sculptured, dark brown form.

Figs.9,10. *C.rubrolineata* Sowerby. Holotype BM(NH) No. 1874.12.11.198; 10.0 mm.

Fig. 11. *C.rubrolineata* Sowerby. Taiwan; 14.6 mm.

Fig. 12. *C.orientalis* A.Adams. Lectotype BM(NH); 13.8 mm.

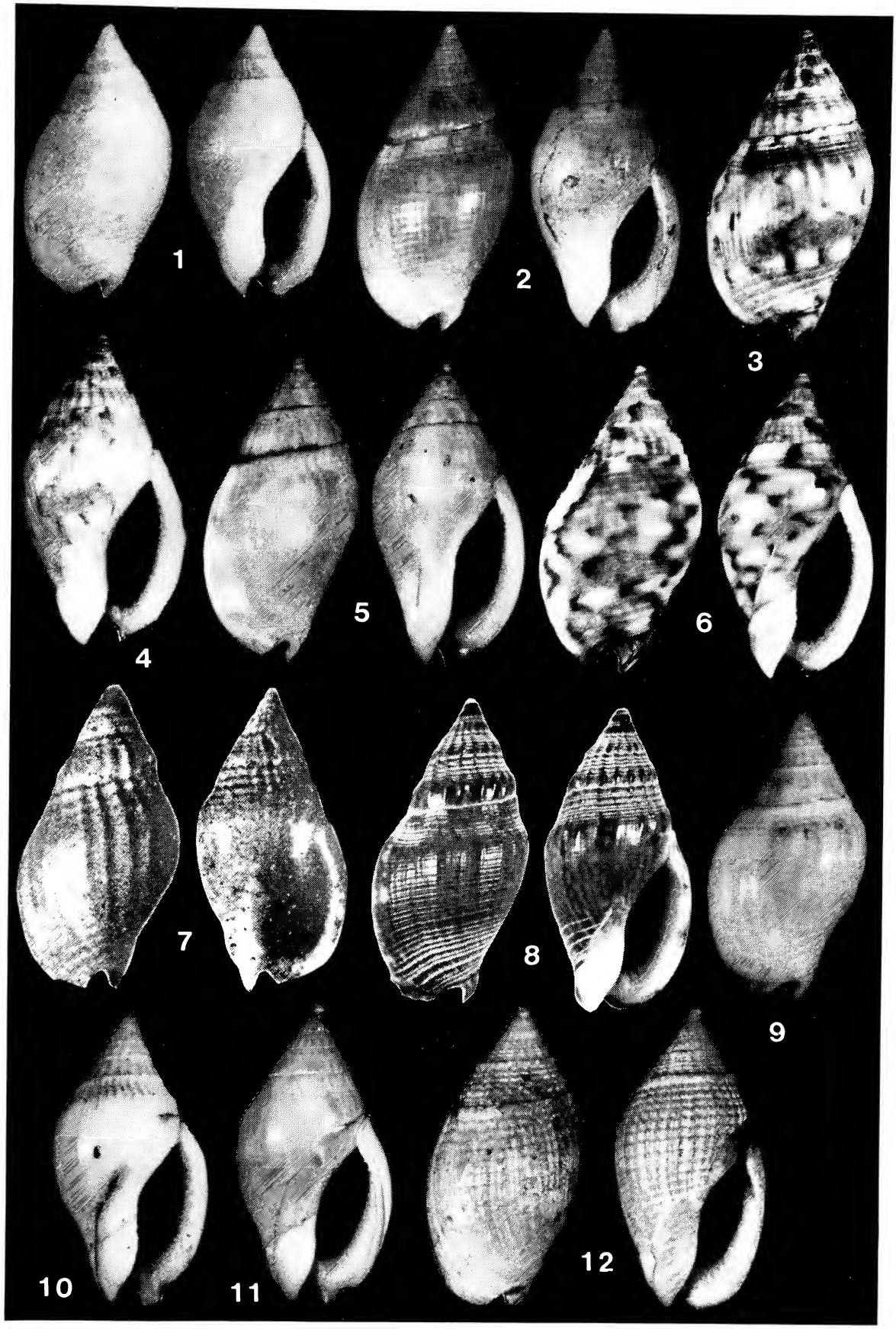
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PLATE 50

Fig. 1. *Cyllene pretiosa* Vredenburg. Type-figure; 13.6 mm (from Vredenburg, 1924, pl.2,fig.2).

Fig. 2. *C.smithi* K.Martin. Lectotype Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9179; 8.7 mm.

Fig. 3. *C.angsanana* K.Martin. Holotype Rijksmuseum van Geologie en Mineralogie, Leiden, No. RGM-9181; 17.3 mm.

Fig. 4. *C.vredenburgi* Gupta. Type-figure; *c.* 12.5 mm. Immature specimen (from Gupta, 1930, pl.5,fig.1).

Fig. 5. *C.gracilenta* (Yokoyama). Type-figure; 18.0 mm (from Yokoyama, 1928, pl.3,fig.4).

Fig. 6. *C.gracilenta* (Yokoyama). Shimijiri group, Yonabaru clay, Okinawa, Miocene of Ryukyu Is; 16.0 mm.

Fig. 7. *C.sulcata* Sowerby. Lectotype BM(NH) No. 1980106; 14.5 mm.

Fig. 8. *C.sulcata* Sowerby. Pt.Cloates, West Australia. AMS No.C-70176; 13.0 mm.

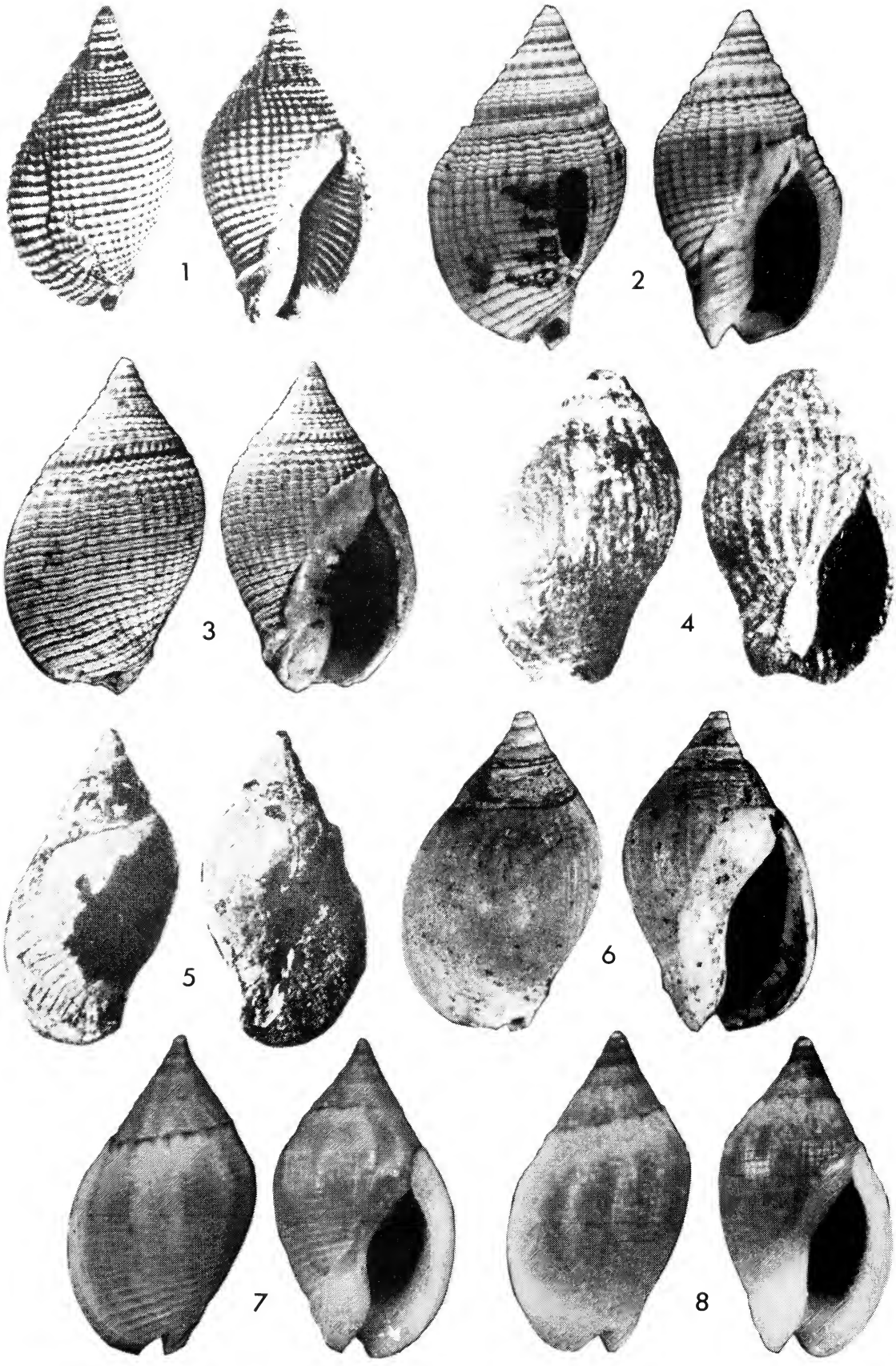
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PLATE 51

Fig. 1. *Cyllene sulcata* Sowerby. Broome, W. Australia; 14.2 mm and 12.7 mm respectively.

Fig. 2. *C.sulcata* Sowerby. Broome, W. Australia; 13.4 mm. Broad form.

Fig. 3. *C.concinna* A.Adams. Worn lectotype BM(NH); 10.8 mm.

Fig. 4. *C.concinna* A.Adams. Holotype of *C.japonica* Pilsbry, Academy Natural Sciences, Philadelphia, No. 82144; 11.8 mm. Smooth form.

Fig. 5. *C.concinna* A.Adams. Kii Peninsula, Japan; 12.3 mm. Granulose form.

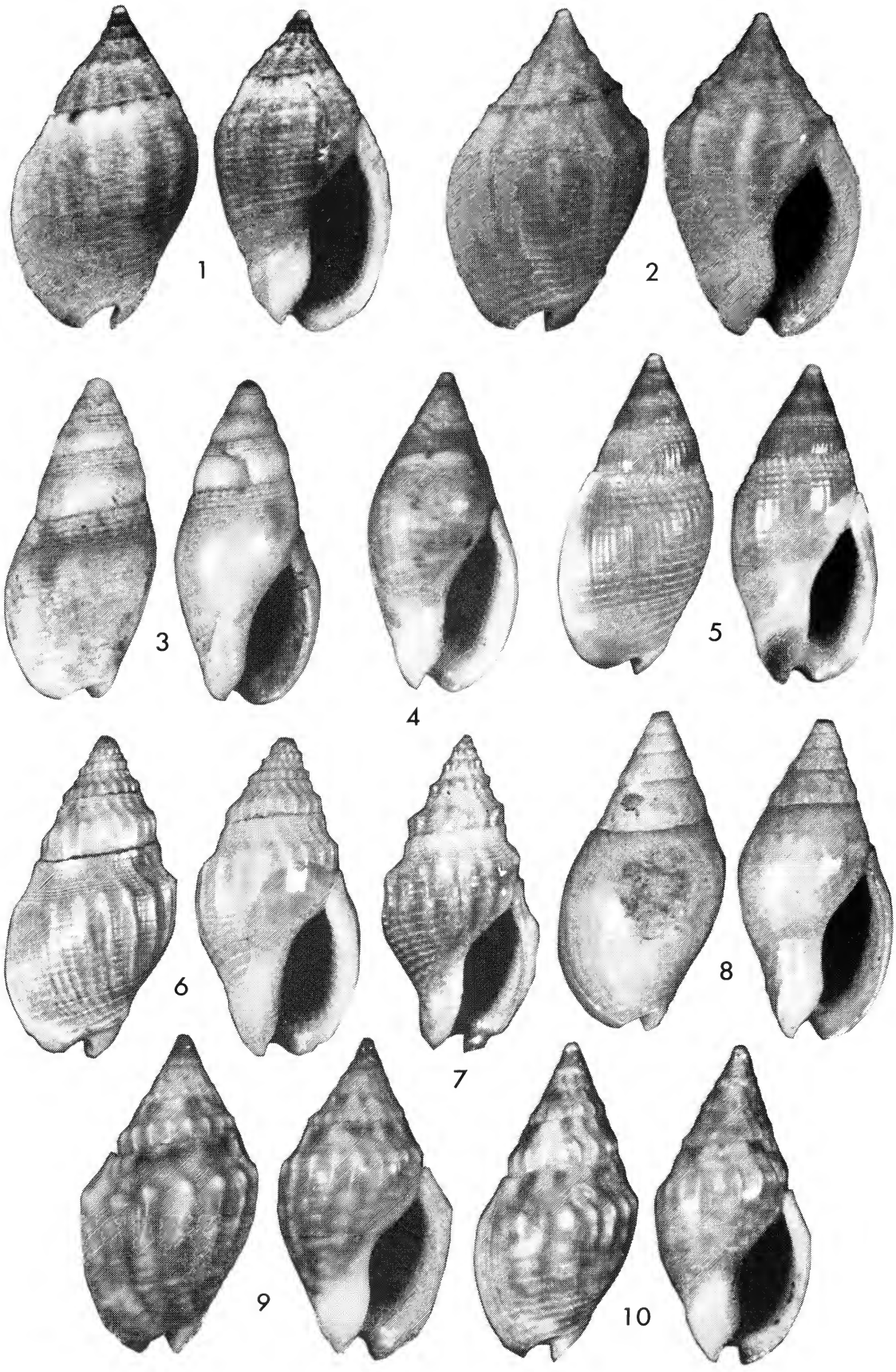
Fig. 6. *C.sibogae* Schepman. Holotype ZMA; 17.4 mm.

Fig. 7. *C.sibogae* Schepman. N. of Port Hedland, W. Australia, 296 m. AMS No. C-114470; 16.0 mm. Immature specimen.

Fig. 8. *C.lactea* A.Adams & Angas. Worn lectotype BM(NH) No. 1870.10.26.86; 13.7 mm.

Fig. 9. *C.royana* (Iredale). Lakes Entrance, Victoria, Australia, 37 m; 13.7 mm.

Fig. 10. *C.royana* (Iredale). Holotype AMS No. C-74642; 15.1 mm.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